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PROCEEDINGS
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PAPERS READ BEFORE THE ACADEMY.

I.

CONTRIBUTIONS TO NORTH AMERICAN BOTANY.

BY ASA GRAY.

Presented May 9, 1883. — Issued Oct. 30, 1883.

I. *Characters of New Compositæ, with Revisions of certain Genera, and Critical Notes.*

Eupatoriaceæ.

STEVIA AMABILIS, Lemmon. *S. laxifloræ* peraffinis, gracilior, bipedalis; foliis omnibus linearibus basi attenuatis (sesquipollicaribus) integerrimis; capitulis effuso-paniculatis; floribus læte purpureis; pappi paleis 5 cum aristis alternantibus brevissimis. — S. Arizona in the plains near Cave Cañon, *Lemmon.* The narrowest-leaved forms referred to *S. laxiflora* (coll. *Wislizenus, Schaffner*) notably approach this.

Asteroideæ.

APLOPAPPUS (ERICAMERIA) MONACTIS. Facie *A. laricifolii*, frutex fastigiato-ramosissimus, 1–5-pedalis, vix resinosus; foliis aceroso-linearibus fere impunctatis; capitulis corymboso-cymosis paucifloris; involucro oblongo 8–10-phyllo; bracteis chartaceis oblongis vel sublanceolatis obtusis; floribus hermaphroditis 5 vel 6, corollæ lobis ovato-oblongis, styli ramis latiusculis appendice subovata acuta superatis; fœmineo unico (interdum nullo), ligula elongato-oblonga; acheniis sericeo-villosis; pappo albo molli. — Borders of the Mohave

Desert, S. E. California, *Palmer* (1876, confounded with *A. laricifolius*), *S. B. & W. F. Parish* (1881), *Pringle*, 1882.

GREENELLA DISCOIDEA. Ramis strictis fastigiatis; capitulis minoribus; ligulis nullis; ovariis glabris demum secus costas minutissime puberulis; pappi corona pluricrenulato nudo. — S. Arizona, in Tanner's Cañon, Sept., *Lemmon*. — *G. Arizonica*, which has been freely distributed by Lemmon and Pringle, by the latter in fruit, has the mature akene very villous, in the manner of *Gutierrezia eriocarpa*, &c. If, disregarding the color of the ray-flowers, this genus were referred to *Gutierrezia*, both would have to be combined with *Xanthocephalum*, which would hardly do.

ERIGERON ARIZONICUS. Ultrapedalis e radice ut videtur annua, ramosus, pube patente cinerea undique hirsutus; foliis fere integerrimis (1–2-pollicaribus), radicalibus oblongo-obovatis in petiolum angustatis, caulinis plerisque lanceolatis acutis arcte sessilibus; ramis monocephalis; involucro (lin. 3–4 alto) cinereo-hirsuto; ligulis (lin. 4 longis) perplurimis angusto-linearibus albis; acheniis obovato-oblongis hirsutulis binervatis; pappo duplici, exteriori setoso-squamellato conspicuo. — S. Arizona, near Tanner's Cañon, Huachuca, *Lemmon*.

ERIGERON NEO-MEXICANUS. *E. delphinifolio* similis; differt (ut dixit Benth.) pube hispida patente, lobis foliorum superne latioribus, ligulis minus numerosis parum latioribus. — *E. delphinifolius*, Gray, Pl. Wright. ii. 77, & Bot. Mex. Bound. 78, non Willd. & HBK. — New Mexico and Arizona, *Wright*, *Bigelow*, *Thurber*, *Palmer*, *Lemmon*. Bentham (in Gen. Pl. ii. 281) indicated this as distinct from the Mexican species; and the differences, though not great, seem to be constant.

ERIGERON LEMMONI. Inter Boreali-Americanas anomalus, e radice perenni diffuso-decumbens, ramosissimus, pube hirsutula cinereus; ramis gracilibus foliosissimis; foliis (parum semipollicaribus) spathulatis, caulinis sæpius 3–5-lobatis seu laciniato-dentatis, ramealibus integerrimis; capitulis brevi-pedunculatis parvis (lin. 2 altis); involucro hirsutulo, bracteis subulatis subæqualibus; ligulis 40–50 purpureis discum longius superantibus; pappo e setis pauciusculis cum setulis minimis. — S. Arizona, in Tanner's Cañon of the Huachuca Mountains, with "stems sometimes 2 feet long," in the specimens a span or two long, *Lemmon*.

ERIGERON OREGANUS. Ut videtur biennis, pube molli tenui pubescens; caulibus e rosula foliorum radicalium plurimis ultraspithamæis debilibus foliosis apice 1–4-cephalis; foliis spathulatis imisve obovato-cuneatis, radicalibus 3–5-lobatis vel inciso-dentatis; capitulis brevi-pedunculatis iis *E. bellidifolii* referentibus sed minoribus, ligulis minoribus angustioribus pallide purpureis; acheniis hirsutis; pappo prorsus simplici. — *E. pulchellus* var., Hook. Fl. ii. 19? — Oregon, along the Columbia River, under overhanging cliffs, in Multnomah Co., *Howell.* — This must rank near *E. Philadelphicum.*

Inuloideæ.

FILAGO DEPRESSA. Soror *F. Californicæ*, sed a basi ramosissima, humistrata, internodiis omnibus brevibus; bracteis fl. fœmineis angustioribus; acheniis obovatis lævibus. — Desert of San Bernardino Co., California, at Hot Springs, &c., *Parry*, 1876 (incomplete specimens), *Parish*, 1882.

GNAPHALIUM PANNOSUM. Lana densa undique incanum; caulibus e radice annua vel lignescente adscendentibus pedalibus simplicibus; foliis spathulatis, radicalibus amplis obovatis triplinerviis (pollicem latis), caulinis semiamplexicaulibus vix decurrentibus, superioribus oblongis (pollicaribus); capitulis glomeratis; involucri bracteis sordide albidis oblongis obtusiusculis. — Mexico, in the mountains near San Luis Potosi, *Schaffner*, 227. *Parry & Palmer*, 420. Habit unlike any of the ordinary Mexican species.

GNAPHALIUM ARIZONICUM. Griseo-lanatum; caulibus gracilibus strictis e radice annua; foliis infimis oblanceolatis brevibus; cæteris angustissime linearibus (lin. latis) basi tenuiter breviter decurrentibus; capitulis parvulis in glomerulis cymoso-fastigiatis aggregatis; involucro oblongo fusco, bracteis oblongo-lanceolatis plerisque acutis tenuibus. (Juxta *G. microcephalum* collocandum.) — S. Arizona, near Fort Huachuca, along exsiccated beds of streams, *Lemmon.*

GNAPHALIUM BOURGOVII. Foliis linearibus attenuato-acutis basi longius alato-decurrentibus supra glabratis lævibus subtus cauleque leviter araneoso-lanatis; involucri bracteis albidis obtusiusculis oblongis, intimis lanceolatis. — Mexico, valley of Cordova, *Bourgeau*, no. 1852.*

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* The Mexican species greatly need revision, and the collocation of original specimens.

G. OXYPHYLLUM, DC. To this is referred no. 551 of coll. Palmer, a woolly form, from near Saltillo, where Gregg collected a form (415) with the wool deciduous, and the somewhat viscid hairiness well developed. Of the same species are Coulter's 451, Parry & Palmer's 417, specimens from Botteri, and one received from Schultz Bip., collected by Schaffner at the foot of Chapultepec, and ticketed "*G. hirtum*, HBK." It may be so; but the leaves are not glaucescent beneath, nor the involucral bracts "argute acutis flavescentibus." The *G. inornatum*, DC., of which no authentic specimens are at hand, may be a

Helianthoideæ.

SILPHIUM ALBIFLORUM. *S. laciniato* affinis, humilius (1–3-pedale); foliis minoribus circumscriptione sæpius rotundatis, petiolo basi dilatato integerrimo; involucro discum haud superante; ligulis albis; acheniis puberulis apice bidentato-alatis et subulato-biaristatis, dentibus aristæ pl. m. exsertæ adnatis. — On limestone rocks, in prairies or on low bluffs, Western and Northern Texas, *Reverchon.* Peculiar in the genus for its white rays, and distinct from the ordinary Compass-plant in the akenes and other particulars.

WYETHIA LONGICAULIS. *W. amplexicauli* peraffinis, elatior; foliis lanceolatis, caulinis omnibus basi angustatis nec amplexicaulibus; capitulis plerumque longe pedunculatis; involucri bracteis exterioribus majoribus foliosis; pappo brevi coroniformi multi-crenulato vel eroso. — Prairies of E. Humboldt Co., California, *V. Rattan,* incomplete specimens in 1876, good ones in 1883.

GYMNOLOMIA ENCELIOIDES. Annua, strigoso-incana; caule ramoso hispidulo; foliis longiuscule petiolatis ovato-oblongis obtusis subintegerrimis, superioribus alternis; involucro (lin. 5 alto) biseriali, bracteis exterioribus oblongo-lanceolatis acutis cano-pubescentibus nunc hispidulis æqualibus interiores sublineares minores paullo superantibus; receptaculo et disco parum convexis; ligulis 10–12 ovalibus vix pollicaribus aureis; corollis disci apice atro-purpureis; bracteis receptaculi apice trifidis; acheniis obovato-oblongis inferne parce versus apicem crebre villosis; pappo aut nullo aut squamellis setiformibus minimis inter pilos achenii summos. — Mohave Desert, near Agua Caliente, S. E. California, *S. B. & W. F. Parish,* April, 1882. This has the habit of an *Encelia;* but the nearly full-grown akenes are not flat nor acute-edged.

GYMNOLOMIA OVATA. Caule stricto herbaceo 2–3-pedali; foliis ovatis brevissime petiolatis serrulatis (sesquipollicaribus) venosis tri-

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small-leaved form of *G. oxyphyllum;* and the branches of Parry & Palmer's 417, as also a part of Coulter's 451, answer to the character. Lanate forms of the species seem to pass into *G. brachypterum,* DC., the originals of which are Berlandier's 769 and 2189. Ghiesbreght's 161, Linden's 1191, and a plant of Schaffner's collection, sent by Schultz as *G. oxyphyllum,* are the same.

G. ATTENUATUM, DC. To this may be referred Liebmann's 309, from Colepa, and a quite similar plant from Orizaba by Schaffner; both have been named *G. Berlandieri,* DC. (of which I have no specimen), but they do not agree with the character of that species, as they do with that of *G. attenuatum;* and they differ from *G. oxyphyllum* in the particulars which DeCandolle mentions. Schultz's determination must have been a mistaken one.

nervatis pube brevi subtus molli supra strigulosa canescentibus; capitulis parvulis paucis in pedunculo communi; involucro campanulato lin. 3–4 alto, bracteis angustis lineari-lanceolatis cinereis; ligulis (lin. 3 longis) 8–10 pallide luteis; disco convexo; acheniis glaberrimis calvis. — Chiapas, Mexico, in forests on the mountain-sides, *Ghiesbreght*, 554.

GYMNOLOMIA PLATYLEPIS. *Tithonia platylepis*, Schultz Bip., and *Mirasolia scaberrima*, Benth. & Hook. This is obviously one of the latibracteate *Gymnolomiæ*. And the genus *Mirasolia* of Schultz Bip. may be suppressed; for the *Tithonia calva*, Schultz, if not truly of that genus, wanting the pappus, may likewise be referred to *Gymnolomia;* and the following is certainly a *Tithonia.*

TITHONIA DIVERSIFOLIA. *Mirasolia diversifolia,* Hemsl. Biol. Centr.-Am. Bot. ii. 168, t. 47. This striking species, collected by Botteri and Bourgeau in the vicinity of Orizaba and Cordova, we take to be a strict congener of *T. tagetiflora* and *T. speciosa.* One or both of the awns or aristiform paleæ of the pappus are not rarely developed.

VIGUIERA DECURRENS. *Tithonia decurrens,* Gray, Pl. Fendl. 85, by misprint "*recurrens*" in Hemsl. Biol. Centr.-Am. Known only from the specimen of Wislizenus, of which I possess merely a part. But it is a *Viguiera* of the same section with *V. excelsa* (which apparently includes the *Tithonia pachycephala,* DC.) and the very similar *V. urticiformis* (*Leighia,* DC., with which Schaffner's no. 267 agrees); also *V. buddleiformis,* Benth. & Hook. The latter appears to include *Helianthus rugosus,* Schauer in Linnæa. And the squamellæ being deciduous as well as the paleaceous awns, this species should rather be restored to *Helianthus.*

VIGUIERA BLEPHAROLEPIS. Frutescens? pube minuta canescens; caulibus ramisve monocephalis; foliis oppositis lanceolatis summisve linearibus acutiusculis basi attenuata sessilibus subintegerrimis supra scaberrimis subtus triplinerviis, venulis reticulatis; involucro (ultra-semipollicari) lato-campanulato pluriseriatim imbricato; bracteis conformibus erectis fere siccis oblongo-spathulatis apice rotundatis margine insigniter hispido-ciliatis, interioribus sensim majoribus; ligulis sublinearibus; acheniis villosis; pappo ut videtur persistente pluri-paleaceo et biaristato, aristis subulatis achenio subæquilongis, paleolis oblongis sæpius inæqualibus, majoribus aristis parum dimidio brevioribus. — Northwestern Mexico, *Seemann.* Apparently not referred to in the Botany of the Herald. My specimen is ticketed "*Tithonia angustifolia,* Hook. & Arn.," which species Bentham refers to *V. buddleiformis,* doubtless correctly. This, although of the same group, is very distinct, and in some respects much resembles *V. sericea* (*Harpalium sericeum*, DC.), of Peru. The dense and rigid ciliation of the involucre is characteristic.

Viguiera helianthoides, HBK. Adopting Bentham's reference of DeCandolle's *V. laxa* and *V. brevipes* to this, the original of the genus, one may confidently add *V. Sagræana* and *V. dentata*, perhaps all of DeCandolle's first section, and at least two of the second. *V. dentata*, the *Helianthus dentatus*, Cav., appears to be well matched by Parry & Palmer's no. 471½, and by corresponding specimens from Schaffner, with upper leaves mainly opposite; also, although the leaves are alternate, by Parry & Palmer's 467, and Bourgeau's 365 and 1222, which Hemsley records as two undetermined species. (No. 1222 has rays in one of our specimens.) In no specimens, even the Cuban, do I find the receptacle so high and narrow as in Kunth's figure; and at first the disk is commonly so low that DeCandolle referred some of the members of this species to his second section. When growing in moist soil and shade the leaves are thin and green (as in *V. Texana*, Torr. & Gray), in drier and more exposed situations they are thicker, smaller, rather rigid, sometimes cinereous, as in *V. brevipes.*

Viguiera canescens, DC., although near the preceding, appears to be a distinct species, having more rigid leaves and akenes whitened by a dense and fine silky villosity. It has been collected by Palmer in Northern Mexico, and by Pringle in Arizona.

Viguiera Ghiesbreghtii. Undique hispidula; caulibus gracilibus oligocephalis; foliis lanceolatis subintegerrimis concoloribus leviter triplinerviis subsessilibus, inferioribus oppositis; capitulis iis *V. buddleiformis* minoribus; involucri bracteis paucioribus minus patentibus, extimis brevibus lanceolatis, intimis oblongo-spathulatis discum subsuperantibus; ligulis linearibus; acheniis (immaturis) fere glabris; pappo pluri-squamellato et 1–3-aristato deciduo. — Mexico, in pine forests near Morelia, *Ghiesbreght*, no. 381 of an old collection.

Viguiera sessilifolia, DC. We seem to have this in no. 453 of Parry & Palmer's collection. But the truncate paleæ are more than four, unless they are early fissile. No. 458 of the same collection seems to be a broad-leaved form of *V. excelsa*, Benth. & Hook. No. 452 is, with little doubt, a state of *V. cordifolia*, Gray.

Viguiera Peruviana, Gray, Proc. Am. Acad. v. 124, appears to be only a glabrate state of *Helianthus aureus*, HBK., the *Harpalium aureum*, DC.

Viguiera Pœppigii. *Helianthus corymbosus*, Pœpp. Pl. Exsic. *Flourensia corymbosa*, DC. Prodr. v. 592. That this is a true *Viguiera* has been noted by Bentham and others. The published specific name of *corymbosa* is quite inapplicable to a plant with elongated and single monocephalous peduncles.

What should be done with the other radiate *Flourensia* of DeCandolle, *F. thurifera*, seems uncertain. Perhaps it should be retained as a section of that genus, under Bertero and Colla's name (not Cassini's) of *Diomedea.* It is no *Helianthus.* And the following is still farther from that genus.

FLOURENSIA CERNUA, DC. l. c.; Gray, Pl. Wright., &c. Hemsley calls this "*Helianthus cernua*, Benth. & Hook. Gen. Pl. ii. 376"; but Bentham, in the work cited, can hardly be said even to refer this and its true congener (notwithstanding the different habit) *F. laurifolia*, DC., to *Helianthus*, although he has not otherwise disposed of these peculiar species. They may justly be regarded as the type of *Flourensia*, for DeCandolle figured *F. laurifolia* to illustrate his genus, which, thus restricted, is a very good one. But DeCandolle's character "corollæ disci faux vix tubo latior" is inapplicable to these species, as also to *F. thurifera.* They have a rather slender proper tube, which is abruptly enlarged into the much broader and campanulate or cylindraceous throat.

HELIANTHUS PARISHII. *H. Californico* affinis, ultra-orgyalis; foliis elongato-lanceolatis pube molli brevi cineris vel canescentibus supra scabris; capitulis semipollicem altis; ligulis ultrapollicaribus; involucri bracteis lineari-subulatis disco longioribus basi villosis; corollis disci supra tubum sericeo-annulatis; pappi paleis tenui-subulatis. — S. E. California, near San Bernardino, in wet places and along streams, *S. B. & W. F. Parish.*

ENCELIA. The presence or absence of pappus proves to be unimportant, and far from constant in the same species. Wherefore, in adopting Bentham's rightful consolidation, the primary sections should be reduced, by referring *Geræa* to *Euencelia*, and *Barrattia* to *Simsia.*

ENCELIA MICROPHYLLA, Gray, Proc. Am. Acad. xv. 37, a Northern Mexican species, of which mature fruit has recently been collected by Palmer, has shrubby stems, foliage not unlike that of *Flourensia cernua*, and the relationship of the two is apparent. It has a pappus of two slender villous awns, which sometimes barely equal and sometimes much surpass the white villosity of the akene.

ENCELIA SCAPOSA, *Simsia* (*Geræa*) *scaposa*, Gray, Pl. Wright. ii. 88, is of the genus; but not *E. microcephala*, which is a genuine *Helianthella*, to a peculiar section of which must be referred the anomalous *E. nudicaulis* and *E. argophylla.*

ENCELIA STENOPHYLLA, E. L. Greene, is a simpler species, with aristate akenes and filiform leaves, from Cedros Islands, Lower California.

ENCELIA HALIMIFOLIA, Cav. Ic. iii. 6, t. 210. This was raised from seeds said to come from "Nova Hispania," i. e. Mexico, and was characterized by "calycibus ciliatis," that is, the involucre with "squamulis ciliatis." Instead of this, DeCandolle, in the Prodromus, has it that the "leaves" are "margine valde ciliatis," which was probably a slip, and as to habitat adds "verosimiliter potius in Peruvia." Now we have a specimen collected by Palmer on the Yaqui River, in the Mexican province of Sonora, which accords well with the original character and figure. *E. conspersa,* Benth. Bot. Sulph., of Lower California, from the description may be the same.

The species of the section SIMSIA, chiefly Mexican, greatly need revision. Hemsley, in the Biol. Centr.-Amer. Bot., has enumerated them from the books; but they should be reduced and characterized by some botanist having access to original specimens. Only three of them occur in the United States; viz. E. EXARISTATA, Gray in Hemsl. l. c., an annual species (which is *S. lagascæformis* of Pl. Wright.), and two nearly related perennials, E. SUBARISTATA, Gray, l. c., and E. CALVA, the *Barrattia calva* of Gray & Engelm. *E. exaristata* is said by Hemsley to be no. 3320 of Bourgeau's collection from Orizaba; but I have it only from S. W. Texas and Arizona, collected by Wright, Thurber, and Lemmon. It is an annual with (so far as known) undivided leaves and appendaged petioles, rather small or narrow heads, an unequal involucre of lanceolate bracts, the inner minutely glandular, rays few and not surpassing the disk, and very smooth and glabrous akenes slightly emarginate at summit, the pappus wanting or minutely biaristellate.

ENCELIA MEXICANA, Mart., a name taken up by Hemsley from DeCandolle's mention, seems to be the best available name for the most common and polymorphous Mexican species, and the one longest known. It is *Coreopsis fœtida,* Cav., therefore *Simsia ficifolia,* Pers., and *Encelia fœtida,* Hemsley, *Simsia auriculata,* DC., and probably *S. amplexicaulis,* Pers., *E. amplexicaulis,* Hemsley. It is also, without much doubt, the *Helianthus amplexicaulis,* DC. Prodr. v. 589. A slender form of it with undivided leaves and exappendiculate petioles is *Simsia Schaffneri,* Schultz Bip., which grows with the ordinary state. A more robust form, also of Schaffner's collection, with large undivided leaves and auriculate appendaged petioles, is *Simsia cordata* of Schultz Bip., probably also of Cassini (*Ximinesia cordata,* HBK., *Encelia cordata*, Hemsley). The root is annual; the involucre between hispid and hirsute; and the akenes obovate-oblong, with shallow notch, pilose-pubescent on the faces, more ciliate towards the summit; awns of the pappus rather long, with more or less scarious-dilated base often fringed with two or three teeth or setæ on each side.

ENCELIA LAGASCÆFORMIS (*Simsia*, DC.) is taken up by Hemsley from my naming after Bentham; but the plants of Hartweg, of Ervendberg, and of Parry & Palmer, cannot be DeCandolle's. They have rather the characters of *E. Mexicana* in a depauperate state. DeCandolle's species is much better represented by a specimen in our herbarium — an imperfect one — from Botteri's collection around Orizaba; slender, with small and narrow heads, an involucre which accords with DeCandolle's character in having (broadly) lanceolate bracts, the outer only half the length of the inner (but these are villous rather than hispid), the rays "about 5" and exserted, the akenes quite glabrous. As the awns are wanting in the specimen, this may be identical with Bourgeau's 3320, referred by Hemsley to *E. exaristata*, to which it is obviously related.

ENCELIA HETEROPHYLLA, Hemsley, l. c., I know only from the figure of *Ximinesia heterophylla*, HBK. It is said to be perennial and yellow-flowered. One may suspect that *E. sanguinea*, Hemsley (*Simsia sanguinea*, Gray, Pl. Wright. i. 107, also distributed by Schultz Bip. as *S. erythranthema*) is only a red-flowered variety of it.

ENCELIA GHIESBREGHTII, Gray, Proc. Am. Acad. viii. 658, has a peculiar habit, in foliage and pubescence agreeing well with the description of *E. sericea*, Hemsley, l. c. It is probably a perennial. The fruit is not sufficiently developed to make sure of the genus.

HELIANTHELLA § ENCELIOPSIS. A subgenus formed for the reception of two anomalous scapose perennials, thick-leaved, silvery-canescent, with large solitary heads (the disk an inch broad and flat); paleæ of receptacle soft and scarious; achenia flat, oblong-cuneate, very villous, with narrow callous margins and summit, the latter bordered between the short subulate awns by a very short fringe of membranaceous and confluent squamellæ.

H. NUDICAULIS. *Encelia* (*Geræa*) *nudicaulis*, Gray, Proc. Am. Acad. viii. 656. Mr. Shockley has recently sent it from the western part of Nevada.

H. ARGOPHYLLA. *Tithonia argophylla*, Eaton in Bot. King. 423. *Encelia* (*Geræa*) *argophylla*, Gray, l. c. This is still imperfectly known.

HELIANTHELLA proper. In revising this genus I find that the following species may be associated as having soft-scarious chaff of the receptacle, and more or less of long villosity at least on the margins of the akenes; viz. *H. quinquenervis* (the large-flowered *Helianthella uniflora*, so called, of the Colorado Rocky Mountains, extending to the British boundary, but not of Nuttall in coll. Wyeth, nor of his character in Trans. Am. Phil. Soc., though he mixed the two in his own collection: it is the *Helianthus quinquenervis*, Hook. Lond. Jour. Bot. vi. 247, of Geyer's collection); *H. Parryi; H. Mexicana; H. microcephala*, the *Encelia microcephala*, Gray, Proc. Am. Acad. viii. 657. The following have chaff of a firmer or chartaceous texture: *H. lancelata*, with hirsute or hispidulous loose pubescence and no long villosity to the ovary or akene; *H. Douglasii*, still known only by the specimen in the Hookerian herbarium, perhaps a form of the preceding; *H. uniflora*, with fine and close pubescence, and more or less villous akenes, at least on the margins (*H. multicaulis*, Eaton, is a form of this, his *H. uniflora* being our *H. quinquenervis*); and *H. Californica*, with nearly all the leaves petioled, and the ovary and akene quite glabrous.

OYEDÆA SEEMANNI. *Viguiera Seemanni*, Schultz Bip. in Bot. Herald, 305; Hemsl. Biol. Centr.-Am. Bot. ii. 178. Good fruit is still needed; but the ovary is glabrous on the sides and with acute edges, and the habit is wholly of *Oyedæa*, to which the plant probably belongs.

ZEXMENIA HISPIDA. *Z. Texana*, Gray, Pl. Wright. i. 112, Bot. Mex. Bound. 92. In the first-mentioned publication the resemblance of our Texan plant to *Wedelia hispida*, HBK., is noted; in the second, the identity is affirmed. This is now beyond question, wherefore it is best to reinstate the original specific name. Bentham and Hooker, in Gen. Pl., still leave Kunth's plant, and therefore Cassini's *Stemmodontia*, in *Wedelia*, while yet recognizing the Texan plant as a *Zexmenia*. The former reference is probably from the published figure, which wants the fruit; the latter, from numerous specimens. The name of the section should be *Stemmodontia*.

ZEXMENIA BREVIFOLIA, Gray, Pl. Wright. i. 112. Nearer than the preceding species to true *Zexmenia*. Although the akenes are, as Bentham states, "sæpe vix alata," yet they are often surmounted by a strong callous wing. Squamellæ of the pappus sometimes very conspicuous, sometimes obsolete in age.

ZEXMENIA AUREA, *Wedelia aurea*, Don in Bot. Mag. t. 3384 (*Verbesina*, DC.), referred here by Bentham (although there are no squamellæ), has been distributed from a collection of Schaffner's (no. 56) as *Z. tuberosa*. The roots swell and become tuber-like.

ZEXMENIA FASCICULATA, Schultz Bip. in Seem. Bot. Herald, 306, taken up later by Hemsley, is not wholly "discoid" as DeCandolle states, some of Berlandier's own specimens having rays. Perhaps it too nearly approaches the narrower-leaved forms of *Z. ceanothifolia*, Schultz, at least as to the *Lipochata umbellata*, DC., of Berlandier's collections.

ZEXMENIA CROCEA, Gray, Pl. Wright. i. 114. To this belongs *Z. stenantha*, Hemsley, Biol. Centr.-Am. Bot. ii. 147. The narrow disk-corollas are common to all the species of this *Lasianthæa* group. From the specific name, it is probable that the unpublished *Z. tagetiflora* of Don, enumerated in Steudel's Nomenclator, is of this species.

ZEXMENIA HELIANTHOIDES, Gray, l. c. To this must belong the *Tithonia ovata*, Hook. Bot. Mag. t. 3901, referred to the genus by Bentham, and taken up as *Z. ovata*, Benth. & Hook., by Hemsley.

VERBESINA, L., partly. It is no longer practicable to keep *Actinomeris* apart from *Verbesina* upon the character of neutral or infertile (although styliferous) rays. Yet the former genus may be kept up for the species upon which Nuttall really established it, relying mainly on the globose head, becoming squarrose in fruit, and the simple small involucre. For the rest, there is neither character nor habit to distinguish the species from *Verbesina*. The North American and Mexican species known to me fall under the following sections or subgenera.

§ 1. VERBESINARIA, DC. Capitula sat angusta, parvula, sæpius cymoso-aggregata vel paniculata: involucrum imbricatum: ligulæ haud numerosæ plerumque fertiles, rarius nullæ: aristæ pappi haud hamatæ.

* Achenia prorsus aptera: receptaculum fere planum: ligulæ 1–5 cum fl. disci luteæ: folia opposita secus caulem decurrentia.

V. OCCIDENTALIS, Walt. Car. 213, a name to be restored for *V. Siegesbeckia*, Michx. Besides being the oldest name under the genus, this is *Siegesbeckia occidentalis*, L. Atlantic U. S.

* * Achenia omnia vel nonnulla alata: receptaculum convexum vel conicum.

V. VIRGINICA, L., is the only N. American species (of the Atlantic States); it has small white-flowered and 3–5-ligulate heads. It includes *V. microptera* and *V. polycephala*, DC., and as a var. (LACINIATA) *V. laciniata*, Nutt., which is *V. sinuata*, Ell. Also, as an anomalous form, —

Var. PALMERI Vegetior, viridior; foliis majoribus (semi- ad subpedales) basi sessili in caulem decurrentibus oblongis plurilobulato-dentatis. — Soledad, near Monclova, Northern Mexico, *Palmer*, 733.

To the same group, although some of them are shrubby, belong *V. gigantea*, Jacq. (which Ghiesbreght collected in Chiapas, although Hemsley does not give it as Mexican), *V. pinnatifida*, Cav. (to which belongs *V. microcephala* of Schultz Bip. and Liebman, can it be also of Benth.?), *V. serrata*, Cav., *V. pauciflora*, Hemsley, which is unknown to me, *V. sororia*, Gray, and a somewhat different set of species, such as *V. virgata*, Cav. (to which *V. persicæfolia*, DC., may be suspected to belong), *V. salicifolia*, HBK. (to which and not to the preceding Bourgeau's no. 963 should be referred, it being the same as Schaffner's plant from Tacubaya, also Parry & Palmer's no. 457, which has been confounded with *V. persicæfolia*, DC.), *V. Grayi*, Benth. & Hook., according to Hemsley, and others with which I am little or not at all acquainted.

§ 2. Pterophyton, Torr. & Gray. Capitula latiora, aut solitaria aut sparsa: involucrum imbricatum (nec foliaceum, nec laxe patens): receptaculum convexum vel conicum: discus fructifer haud squarrosus: ligulæ aut neutræ, aut sæpius styliferæ sed steriles, rarius fertiles: aristæ dum adsint rectæ. — *Pterophyton*, Cass. & *Actinomeris*, Nutt., pro parte.

To this, rather than to a separate and ill-definable section, I should refer various species which have not winged stems, even if they should have fertile ray-flowers. The U. S. species with naked stems are, —

V. Longifolia, *Actinomeris longifolia*, Gray, Pl. Wright. ii. 89, a peculiar species thus far confined to Arizona. The involucre is disposed to be foliaceous-bracted.

V. Wrightii, *Actinomeris Wrightii*, Gray, Pl. Fendl. 85; Rothrock in Wheeler Rep. t. 8. Texas to Arizona, and recently collected by Palmer in Mexico.

V. Warei, *Actinomeris pauciflora*, Nutt., of Florida. There is a Mexican *V. pauciflora* of Hemsley.

V. nudicaulis. *Helianthus ? aristatus*, Ell. Sk. ii. 428. *Actinomeris nudicaulis*, Nutt. Trans. Am. Phil. Soc. S. Atlantic States.

Of the wing-stemmed species, or *Pterophyton* proper, there are only two U. S. species known, viz.: —

V. heterophylla, *Actinomeris heterophylla*, Chapm. in Coult. Bot. Gazette, iii. 6; native of Florida, most related to the preceding.

V. helianthoides, Michx., *Actinomeris helianthoides*, Nutt.; from Ohio to Texas.

Wing-stemmed Mexican species known to me are, —

V. OVATA, *Coreopsis ovata*, Cav. Ic. t. 280, mentioned under *Actinomeris* by Nuttall, taken up by DeCandolle, and seemingly known to recent botanists only by Coulter's no. 362, which is described by Hemsley. It is more polycephalous than the figure, and the leaves of both specimens and figure are oblong, not ovate.

V. TETRAPTERA. *Coreopsis alata*, Cav. Ic. iii. t. 260. *Helianthus tetrapterus*, Ortega, Dec. vi. 74. *Pterophyton alatum*, Cass. xliv. 49. *Actinomeris tetraptera* and probably also *A. tetragona*, DC. Prodr. *V. scabra*, Benth. Pl. Hartw. 41, is said to belong here.

V. COULTERI. Bipedalis e radice perenni, pube molli cinerea; caule inferne foliato alato superne gracili longe pedunculiformi mono—oligo-cephalo; foliis plerisque oppositis obovatis vel spathulatis subserratis supra puberulo-scabridis subtus canescentibus, summis bracteiformibus minimis linearibus; capitulo hemisphærico lin. 3 alto; involucri bracteis biseriatis lanceolatis æquilongis; ligulis circa 12 oblongis styliferis, tubo etiam corollis disci hirsutissimo; ovariis pilosis biaristatis. — Zimapan, Mexico, *Coulter*, 341, 369.

V. CAPITANEJA, Nees in Linnæa, xix. 729. *Actinomeris pedunculosa*, DC. Prodr. v. 576; a somewhat common species. The popular name "Capitaneja," according to Schaffner, is applied to *V. tetraptera*, probably to other species.

V. NERIIFOLIA, Hemsley, no. 528 of a collection of Ghiesbreght distributed from our herbarium, and *V. Oaxacana*, DC., which Hemsley informs us is quite different, belong to a peculiar group, perhaps to be associated with *V. hypoleuca*.

Species of Mexico known to me, of the naked-stemmed group, are, —

V. HYPOLEUCA, Gray, Proc. Am. Acad. xx. 37.

V. STRICTA. *Actinomeris stricta*, Hemsl. Biol. Centr.-Am. Bot. ii. 186. The ray-flowers are not rarely styliferous and even form akenes, but wingless and probably infertile ones. Besides the collections cited by Hemsley, this is Schaffner's 343, also Palmer's 627, 628.

A peculiar species from the Mexican dominion is, —

V. VENOSA, E. L. Greene in litt. Fruticosa, fere glabra et lævis; ramis immarginatis; foliis oppositis alternisque chartaceis ovatis et ovato-lanceolatis cuspidato-acutis subintegerrimis triplinerviis reticulato-venosis utrinque viridibus minutissime scabridis basi in petiolum marginatum subito contractis; capitulis pauciusculis laxe cymoso-paniculatis; involucro campanulato lin. 3 alto disco breviore, bracteis oblongis lanceolatisque adpresso-imbricatis triseriatis, exterioribus bre-

vioribus herbaceis; receptaculo subplano; ligulis pauciusculis parvulis; acheniis obovatis subpilosis aut anguste aut latiuscule alatis aristis 2 gracilibus parum longioribus. — Cedros (miscalled Cerros) Islands, off Lower California; spec. in herb. Calif. Acad., the collector unknown.

§ 3. XIMINESIA. Capitula (sparsa) lata, disco subplano: involucrum laxe patens, e bracteis linearibus foliaceis: ligulæ plures, majusculæ, fertiles: cæt. præcedentis.

V. ENCELIOIDES, Benth. & Hook. l. c. ex Hemsley, l. c. *Ximinesia encelioides*, Cav. Ic. ii. 60, t. 178. A familiar Mexican species, now widely disseminated.

V. COAHUILENSIS. Adsurgens e radice perenni, pedalis; caulibus foliosis subramosis hirsutis; foliis discoloribus (supra hirto-pubescentibus subtus tomento albido canescentibus) lato-lanceolatis repando- nunc argute serratis basi parum angustata sessilibus plerisque secus caulem alato-decurrentibus; capitulis paucis (lin. 4–5 altis); involucro subcampanulato e bracteis linearibus foliaceis æqualibus sursum patentibus; ligulis 8–10 linearibus fœmineis fertilibus; disco convexo; acheniis parvulis hirsutis ut videtur omnibus exalatis aristis gracillimis haud longioribus, vel in radio arista altera dimidio breviore. — Mountains six miles east of Saltillo, Coahuila, *Palmer*, 584, 619. Species apparently allied to *V. mollis*, HBK., and intermediate between the *Ziminesia* and *Pterophyton* sections.

§ 4. HAMULIUM, DC. Capitulum (longe pedunculatum sæpius solitarium) latum, hemisphæricum: involucrum breve: ligulæ plurimæ disco breviores, fertiles: achenia 1–2-aristata, aristis gracilibus, uno alterove apice hamato. Cæt. fere § 2.

V. ALATA, L., *Hamulium alatum*, Cass. Dict. xx. 261; said to be Mexican as well as W. Indian.

V. ANCISTROPHORA. *Ancistrophora Wrightii*, Gray, Mem. Am. Acad. n. ser. vi. 457. *Hamulium Wrightii*, Schultz Bip. *Verbesina Wrightii*, Griseb. Cat. Cub. 155. A delicate and stemless Bellis-like little annual, of Cuba, the original specific name of which is superseded by the Texan plant formerly referred to *Actinomeris*.

§ 5. PLATYPTERIS, DC. excl. § 2. Capitula hemispherica, magna vel majuscula, radio deficiente homogama; floribus disci numerosissimis croceis: involucrum imbricatum pluriseriale: receptaculi paleæ angustæ, carinatæ, carina pl. m. hispidulo-ciliata: folia opposita, secus caulem alato-decurrentia.

V. CROCATA, Less., DC., cum syn.

V. FRASERI, Hemsl. Biol. Centr.-Am. Bot. ii. 187, t. 48. Near to

the following, which, taken up by the name only from a specimen in the Kew herbarium, should have its publication completed by a character.

V. OVATIFOLIA, Gray, ex Hemsl. l. c. 189. "Herba fruticiformis 8–10-pedali" ex inventore, scabrida; foliis ovatis acutis subsessilibus denticulatis; capitulis subcymosis brevi-pedunculatis semipollicem altis; involucri bracteis parvulis ovatis oblongisque adpressis; corollis parce hirsutulis; acheniis immaturis oblongis; aristis subulatis basi alæ accretis. — Chiapas, S. Mexico, coll. *Ghiesbreght*, 523.

COREOPSIS ANTHEMOIDES, DC., is a not uncommon Mexican species, which very closely imitates *Bidens daucifolia* and *B. ferulæfolia* on a small scale, only wanting the awns. I have it not with mature akenes. It is Bourgeau's 836, and Coulter's 378, which are doubtfully referred here by Hemsley. And Schultz sent it to us, from an old collection by Schaffner, under two unpublished names, viz. *Bidens Coreopsidis* and *B. Schaffneri*. The keeping up of the two genera, *Bidens* and *Coreopsis*, necessitates a wholly artificial division of the connecting forms.

COREOPSIS SCHAFFNERI. *Eucoreopsis, Diodonta*, facie *Bidentis angustissimæ*, glaberrima; caulibus herbaceis e radice perenni 2–3-pedalibus ramosis gracilibus; foliis angustissime linearibus integerrimis aliis integris aliis tripartitis; capitulis parvulis corymboso-paniculatis; involucro ima basi pubescente, bracteis glabris subæquilongis, exterioribus angusto-linearibus laxis, interioribus lanceolatis; ligulis aureis subintegris lin. 4 longis; acheniis sublinearibus basi attenuatis lin. 3 longis biaristulatis, aristis fere lævibus vix lineam longis, demum quandoque deciduis. — Mexico, near San Luis Potosi, *Schaffner*, 202, *Parry & Palmer*, 448, 448½.

ELECTRA, DC., it were better to retain as a genus, thus excluding all fertile- or even styliferous-rayed species from *Coreopsis*. But if not kept up, it would rather be an aberrant *Leptosyne* (wanting the annulus to disk-corolla), a genus which takes in all the other styliferous *Coreopsides* of the Genera Plantarum, and also *Coreocarpus*, Benth. Its section *Pugiopappus* (*Agarista*, DC.) comes down to two species, *L. calliopsidea*, with a var. *nana*, and *L. Bigelovii*, the *P. Breweri* being only a form of the latter.

BIDENS HETEROPHYLLA, Ort. This includes *B. longifolia*, DC., as well as *B. arguta*, HBK., referred here by Hemsley. Palmer's specimens (634), collected at Parras, are very like Berlandier's. To Hemsley's references may be added 363 of Bourgeau, 384 of Schaffner, and 717 of Berlandier. A genuine form, collected by Pringle in Arizona, appears to connect with this species the singular variety

(*Wrightii*) of Pl. Wright. ii. 90, which we have also from Rothrock and from Lemmon.

BIDENS LEUCANTHA, Willd. This, the *Coreopsis leucanthema*, L. Amœn. Acad., *C. leucantha*, L. Spec. ed. 2, 1282 (Desc. Fl. Ant. t. 583), and the *C. coronata*, L. as to Plumier's plant, I take to be quite distinct from the radiate form of *B. pilosa.* The *B. striata*, Sweet, Brit. Fl. Gard. t. 237, represents a large-rayed form of it.

BIDENS DONDIÆFOLIA, Less. To this must belong no. 551 of Ghiesbreght's Chiapas collection, perhaps also 569 and 570.

BIDENS PROCERA, Don in Bot. Reg. t. 684. An older and surer name for the plant which I had in Pl. Wright. referred to *B. fœniculifolia*, DC., probably correctly. It is known by its annual root, head of numerous short and (for the section) broadish akenes (outer cuneate-oblong and only 2 lines long, inner cuneate-linear and 3 lines long), not overtopping the disk, as in its allies, and the rather long and conspicuously barbed awns. Hemsley has confounded it with the similar perennial species, *B. ferulæfolia*, DC., *Coreopsis ferulæfolia*, Jacq. Hort. Schœnb. t. 375, and Bot. Mag. t. 2059, which I take to be the species still cultivated in the gardens in a low form, and which has the narrow linear akenes of the section, and short inconspicuously barbed awns. But the fruit is not described by Jacquin, nor in the Bot. Magazine. To *C. procera*, the annual species, I refer Schaffner's no. 231, Bourgeau's 502, and perhaps Gregg's 397, which has no fruit, nor root. To *B. ferulæfolia*, Bourgeau's 954½. and 85 and 533 of Ghiesbreght's collection.

Allied to *B. ferulæfolia* are *B. daucifolia*, DC. (if no. 1117 of Parry and Palmer's collection is that species), and *B. caucalidea*, DC. (to which Parry and Palmer's 484 has been referred); perhaps also the *Cosmos chrysanthemifolius*, HBK. t. 382, which is certainly a *Bidens*, and which should be re-examined at Berlin, to ascertain if it may not have had yellow ligules. In that case, as the habitat "Nova Hispania" is given with a query, this may be *Bidens humilis*, HBK.

"BIDENS SEEMANNI," Schultz Bip. in Seem. Bot. Herald, 307. To this has been wrongly referred no. 485 of Parry and Palmer's Mexican collection, which seems to be only *Cosmos crithmifolius*, HBK. But there is a plant of an early collection by Ghiesbreght, no. 264, which may be it (if so, *Cosmos Seemanni*), having filiform divisions to its leaves, and essentially beakless 6-awned akenes. *Cosmos tenuifolius*, Lindl. Bot. Reg. t. 2007, is only *C. bipinnatus*, Cav.

THELESPERMA AMBIGUUM. This name is assigned to the radiate species which replaces *T. filifolium* in the western part of Texas and adjacent parts of New Mexico and Colorado. It has been confounded sometimes with *T. filifolium*, sometimes with *T. subsimplicifolium*. From the former it is distinguished by a more rigid habit, coarser and less dissected foliage, and by being truly perennial, spreading by creeping rootstocks. The latter goes into a section containing also *T. subnudum* and *T. longipes*, well characterized by short corolla-lobes and a rudimentary or obsolete pappus.

Madieæ.

HEMIZONIA PANICULATA. *H. floribundæ* sat affinis; caule inferne hirsuto; foliis caulinis plerisque pinnatifidis, ramealibus integerrimis linearibus parvis; capitulis laxe paniculatis ramulos bracteolatos terminantibus; ligulis 8; bracteis receptaculi aut fere discretis aut ultra medium connatis; floribus disci 10–12; acheniis radii scrobiculato-pauci-rugosis, rostro brevi arrecto; disci haud raro fertilibus pappo 8–10-paleato, paleis subcoriaceis oblongis obtusis extus marginibusque hirsutis tubo proprio corollæ longioribus. — Santa Barbara to San Diego Co., California, *Brewer*, *Parish*, *Jared.* Includes the plant of coll. Brewer which was referred to *H. angustifolia* var. *Barclayi* in the Botany of California.

HEMIZONIA WRIGHTII. Præcedenti affinis, inter *H. Kelloggii*, Greene, et *H. fasciculatam* collocanda, aut erecta 1–3-pedalis ramis patentissimis, aut decumbens ramosissima; foliis inferioribus laciniato-pinnatifidis hirsutis, ramulinis parvis cum pedunculis bracteisque involucri ovato-lanceolatis; floribus radii sæpius 5, ligulis lato-cuneatis, acheniis subtuberculato-rugosis brevi-rostellatis; floribus disci 5–6 bracteis receptaculi pl. m. connatis circumdatis sterilibus, pappo e paleis 8–9 oblongis sat robustis apice eroso-laciniatis. — California, common in the vicinity of San Bernardino, first coll. by *W. G. Wright*, then by the brothers *Parish* and by *Parry*, also as a waif near San Francisco, *Greene*, probably conveyed by railway.

LAYIA (CALLIGLOSSA) DOUGLASII, Hook. & Arn. Bot. Beech. 358. This obscure species, so long known only from the single specimen collected by Douglas near the Great Falls of the Columbia River, has at length come to light in the collection of *Marcus E. Jones*, in 1882. He found it at Austin, Nevada. In aspect and in the white rays it resembles a small form of *L. glandulosa;* and it has a few small stipitate glands on the involucre and the uppermost leaves. It is well marked by the pappus, which consists of about 10 linear-subulate flat awns, the margins of which toward the base bear a moderate number of long and straight villous hairs. It is white; the fulvous tinge in that of the original specimen was probably from discoloration. — To Mr. Jones we are likewise indebted for the following addition to the *Calliachyris* group of the *Calliglossa* section.

LAYIA JONESII. *L. Fremonti* peraffinis, parce hispidula, viscida, superne glandulis parvis stipitatis parce conspersa; foliis pinnatifidis vel superioribus tridentatis nunc integerrimis; ligulis breviusculis; bracteis receptaculi tantum ad marginem; pappo e paleis ovatis seu ovato-oblongis acuminato-acutatis erosulo-denticulatis nudis corollæ tubo haud longioribus. — California, near San Luis Obispo, *M. E. Jones.* — Forms like these, distinguished almost wholly by the pappus, have to be noticed and characterized; but they weaken the value of the species in this genus.

Helenioideæ.

CLAPPIA SUÆDÆFOLIA, Gray in Bot. Mex. Bound. 93. This has been rediscovered by Dr. Havard, U. S. A., on the alkaline flats toward the mouth of the Pecos River, in the southwestern part of Texas. A good specimen received from him shows that the plant is an undershrub; that the linear leaves are so fleshy as to be terete, and are neither punctate nor at all glandular; so that the genus must be excluded from the *Tagetineæ.* It may rest in the somewhat artificial subtribe *Jaumieæ* of Bentham and Hooker. But the genus consists solely of the original species, which, considering the state of the materials, has been well figured by Bentham in the Icones Plantarum, t. 1105. The supposed second species, *C. aurantiaca,* Benth. Ic. Pl. t. 1104, is very different, and if not *Dysodia appendiculata,* Lag., with the oil-glands overlooked or wanting in the specimen, must be very nearly related to that species.

LAPHAMIA and PERITYLE. A new study of all the species confirms our conclusion (in Proc. Am. Acad. ix. 194), that these nearly related genera should be preserved with their original limitation, rather than that suggested by Bentham in the Genera Plantarum. The pappus gives better characters than the style-appendages, and there is no good distinction to be found in the involucre.

LAPHAMIA divides into three sections: — 1. PAPPOTHRIX, for *L. rupestris* and *L. cinerea.* 2. True LAPHAMIA, for *L. Lemmoni* and its var. *pedata, L. halimifolia, L. angustifolia* and its var. *laciniata, L. Palmeri,* with flowers said to be "creamy-white," *L. megacephala,* Watson, and *L. Stansburii.* 3. DITHRIX, with a pair of stouter naked bristles, one from each angle of the akene, and the head only 6–8-flowered, *L. bisetosa,* Torr.

Peritylе makes the closest approach to the foregoing genus in *P. dissecta* (*Laphamia dissecta*, Torr. in Pl. Wright. ii. 81), the akene of which is hardly ciliate, and the crown of the pappus is reduced to a mere border, the single awn sometimes wanting. The style-branches are slender and subulate, not "short and obtuse," as was stated in Proc. Am. Acad. ix. 195. Among the genuine species, *P. Fitchii*, Torr. in Pacif. R. Rep. iv. 100, founded on imperfect materials, probably from the islands off California, appears to include (as var. *Palmeri*) the plant collected by Palmer on Guadalupe Island, no. 44, and distributed as *P. Emoryi*. It has thin-edged akenes, nearly hirsute-ciliate, and somewhat falcately oblique; the pappus sometimes obsolete, sometimes of numerous squamellæ united into an erose crown, and no awn. Otherwise it is hardly distinguishable from *P. Californica*, Benth. (of the section having callous-margined akenes densely long-ciliate), which proves to be the *P. Emoryi*, Torr., including var. *nuda*, the *P. nuda*, Torr. *P. plumigera* is still known only from Coulter's specimens. *P. microglossa*, Benth., which had been overlooked, is the *P. Californica* of Gray, Proc. Am. Acad., &c. (but not of Benth.), and *P. Acmella*, Gray, Pl. Fendl. 77, &c. There is a marked var. *effusa*, very much branched and paniculately floriferous, with unusually small heads and akenes, from Arizona, *Pringle*. *P. leptoglossa*, *P. Parryi*, and *P. aglossa* remain as rare but seemingly good species, all with setaceous-filiform style-tips.

EATONELLA, Gen. Nov. Subtrib. *Peritylearum*.

Capitulum circiter 20-florum, heterogamum, floribus radii fœmineis, ligulis parvulis, vel radio deficiente homogamum. Receptaculum planum nudum. Involucrum e bracteis planis 5–8 ovalibus oblongisve æqualibus. Corollæ disci breviusculæ, superne dilatata 4–5-dentatæ. Styli rami fl. disci breves truncato-obtusi. Achenia compressa (extima nunc obcompresso-triangulata), calloso-marginata, crebre ac longissime villoso-ciliata. Pappus e paleis paucis sæpius 2 latissimis enerviis. — Herbæ annuæ vel biennes, Californicæ, lanosæ, alternifoliæ, capitulis parvulis subsessilibus. Species 2.

Eatonella nivea. Pygmæa, vix caulescens, laxe lanosissima; capitulis inter folia rosulato-conferta spathulata integerrima sessilibus; involucri bracteis 8 angusto-oblongis; ligulis totidem parum exsertis; corollis disci 5-dentatis; acheniis lineari-oblongis atro-nitidis coma niveo-alba ciliatis; pappi paleis 2 opacis latissimis subtruncatis parce eroso-dentatis e centro in aristam longiorem subulatam productis. — *Burrielia nivea*, D. C. Eaton in Bot. King Exp. 174, t. 18. *Acti-*

nolepis ? (*Eatonella*) *nivea*, Gray, Bot. Calif. i. 379. — Eastern side of the Sierra Nevada, *Watson*, *Lemmon.*

EATONELLA CONGDONI. Floccoso-lanata; caulibus ultraspithamæis; foliis sparsis oblongo-linearious sæpe sinuato-dentatis vel repandis; involucri bracteis 5 lato-oblongis; ligulis ut videtur nullis; corollis disci 4-dentatis; acheniis ovalibus faciebus pubescentibus mox glabratis, extimis triquetro-obcompressis, cæteris plano-compressis; pappo villum achenii haud superante, paleis paucis diaphanis eroso-laciniatis muticis. — Deer Creek, Tulare Co., California, *J. W. Congdon*, and southern part of the San Joaquin Valley, *Parry.*

The suggestion that the original species was of a new genus being now confirmed by the discovery of a second species, though of somewhat different habit, the genus is now characterized, and named in honor of Professor Daniel Cady Eaton of Yale College, who elaborated the Compositæ of Mr. S. Watson's collection in King's expedition along the fortieth parallel, in the published report of which *E. nivea* is described and figured, and its peculiarities indicated. One would wish that the name of our most accomplished pteridologist should be associated with a new genus of Ferns, but such are not met with. We must be content with a genus of the order which, next to Ferns, he has most studied, and the type of which he has himself illustrated. Although the habit and other characters are of the *Bahia* group, the achenia refer it to the subtribe *Peritylecæ.*

MONOLOPIA GRACILENS. E grege *M. majoris*, multum tenuior, paniculatim ramosa; foliis linearibus vel lanceolatis; involucri parvuli (¼-pollicaris) bracteis 8 ad basim usque discretis; acheniis glabratis. — Coast Range of California, near New Almaden and Santa Cruz, *Torrey*, 1865, and later collected by *S. G. Isaman* (received from Prof. Bailey), *Bolander*, and *Pringle.*

SYNTRICHOPAPPUS LEMMONI. Nana, gracilis, lana laxa mox decidua; foliis spathulatis seu linearibus integerrimis; involucri bracteis 6 vel 8 angusto-oblongis; ligulis parvulis roseo-albis; corollis disci luteis; pappo nullo. — *Actinolepis Lemmoni*, Gray, Proc. Am. Acad. xvi. 102. — S. E. California, on the Mohave Desert, *Lemmon.* Summit of Cajon Pass, *Parish.* — This little plant is found to have the very short proper tube and elongated throat of the corolla and the asteroid style-branches of *Syntrichopappus.* So that, in the readjustment of the related forms, this is left to go into the latter genus, notwithstanding the absence of pappus.

BAERIA, Fisch. & Meyer, as extended by Bentham in the Gen. Plantarum (*Burrielia* excluded, chiefly on account of its slender style-appendages), and adopted in the Botany of California, we must now extend so as to take in *Ptilomeris*, which certainly cannot go with *Actinolepis.* As to the carination and internal saccation or folding of the involucral bracts along the axis or at base, partially embracing a subtended akene, this is quite as distinctly seen in Nuttall's *Dichæta*, and there are traces of it in the typical species of *Baeria.* Some additional species having recently been recognized, a key to those now known is appended.*

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* BAERIA, Fisch. & Meyer, extended.

§ 1. EUBAERIA. Pappus when present uniform (rarely unequal), of entire paleæ or paleaceous-based awns: leaves entire except in *B. platycarpha:* ligules well exserted.

* Akenes with convex or narrowed summit and therefore comparatively small areola, mostly glabrous or glandular and papillose: pappus aristiform or commonly none: heads comparatively large. — *Baeria*, Fisch. & Meyer.

B. MACRANTHA. At least sometimes perennial (all others are annual), rather stout; leaves somewhat 3-nerved and obtuse, hispidly ciliate below; involucral bracts about 12, thickish-herbaceous; ligules elongated; pappus mostly none. — *B. chrysostoma*, var. *macrantha*, Gray, Proc. Am. Acad. ix. 196, and Bot. Calif. *Burrielia chrysostoma*, var. *macrantha*, Gray in Pacif. R. Rep. iv. 106. — Var. PAUCIARISTATA. Lower, clearly perennial, leafy only toward base; rays shorter; akenes scabrous with acute conical papillæ; pappus not rarely present, of 1, 2, or sometimes 3 subulate and flattened chaffy awns rather than paleæ, ather shorter than the akene. — Mendocino Co., *Bolander, Pringle.*

B. CHRYSOSTOMA, Fisch. & Meyer. Bracts of involucre 7 to 12, or fewer in depauperate specimens; linear-clavate akenes either wholly smooth or sprinkled with glandular atoms and papillæ; pappus always wanting.

* * Akenes with broader and truncate summit, usually bearing a paleaceous and mostly awned pappus (but this occasionally wanting, perhaps in every species), more or less hispidulous and 4-angled, not glandular.

+ Involucre and commonly herbage hirsute-pubescent, the leaves mostly hirsute-ciliate toward base: plants slender, very variable in size according to season and station.

B. GRACILIS, Gray, l. c. Bracts of involucre and rays 10 to 12 or reduced to 5 or 6; pappus when present of 2 to 5 awned paleæ (the smaller number usually in the ray), which about equal the length of the akene. — *Burrielia gracilis* and *B. tenerrima*, DC. Prodr. *B. hirsuta*, Nutt., a form which wants the pappus. The original of Douglas has 3 or 4 small lanceolate paleæ of the pappus tapering gradually into the slender awn; it therefore approaches the extreme form in that direction, i. e. Var. ARISTOSA, in which the awn is very gradually and inconspicuously widened downward, as represented by *Burrielia gracilis*, Hook. Bot. Mag. t. 3758. The opposite extreme is Var. PALEACEA, with awns abruptly dilated at base into an oval or ovate palea. This is *Burrielia longifolia* and *B. parviflora*, Nutt. l. c.

B. CURTA. Heads only 2 or 3 lines high; bracts and rays 8 or 10; pappus of

BAHIA and ERIOPHYLLUM, Lagasca. These appear to be two well-recognizable genera, as DeCandolle suspected, although he was unable

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ovate or oblong pointless paleæ, not exceeding the breadth of the akene, usually 4 or 5, or in ray-flowers reduced to a single one, in some plants all obsolete. — S. E. California, near San Bernardino, *W. G. Wright*, *Lemmon*, the latter with obsolete or unipaleaceous pappus.

+- +- Involucre and whole herbage either glabrous or minutely soft-pubescent, no hirsute hairs: heads middle-sized: pappus of firm ovate paleæ abruptly attenuate into an awn, the whole as long as the akene: leaves rather fleshy,

++ Narrowly linear, quite entire.

B. CARNOSA, Greene in litt. Stem with some minute tomentulose pubescence, glabrate; bracts of the involucre about 7, oblong, obtuse, thickish-herbaceous, smooth, at maturity carinate, having a very strong and salient midnerve and an obscure distant lateral pair; rays oblong; akenes densely hispidulous-canescent; pappus-paleæ 4, rarely 5, subulate-awned. — Salt marsh at Vallejo, on the Bay of San Francisco, *E. L. Greene*, April, 1883.

B. CLEVELANDI. Branches and peduncles slightly pubescent; bracts of involucre 8 to 12, ovate, rather obtuse, with one or three obscure nerves at base; rays oval; young akenes minutely scabro-hispidulous; paleæ of pappus slender-awned, only 2 in disk and ray. — Near San Diego, *Cleveland*, 1874.

++ ++ Nearly filiform leaves 3–5-parted or some entire.

B. PLATYCARPHA, Gray, l. c. Slightly pubescent throughout; bracts of involucre 6 or 7, ovate, acutish, lightly and about equally 3-nerved at base; rays narrowly oblong; paleæ of pappus slender-awned, 6 or 7 both in ray and disk. — Thus far received only from the valley of the Sacramento, station unknown, coll. by *Stillman*.

§ 2. DICHÆTA. (*Dichæta*, Nutt.) Pappus (occasionally wanting) of two forms,

* Unlike in disk and ray, in both of about 5 fimbriate-laciniate paleæ, in the former awned, in the latter mostly muticous: leaves entire.

B. PALMERI, Gray, Bot. Calif. i. 376, is only of Guadalupe Island off Lower California, *Palmer*.

* * Not unlike in disk and ray, composed in both of truncate or muticous short paleæ between 2 or 3 awned ones or naked awns.

+- Rays hardly exserted: leaves all entire: pappus of 3 to 5 awns and at least twice as many squamellate narrow laciniate paleæ.

B. MARITIMA, Gray. Farralones Islands. Should be collected anew.

+- +- Rays usually exserted: pappus sometimes wanting: some of the leaves laciniate or pinnatifid: involucral bracts of the next section. — *Dichæta*, Nutt.

B. FREMONTI, Gray. Leaves slender; pappus of 4 slender awns and of narrow entire or 2-cleft small paleæ.

B. ULIGINOSA, Gray. Leaves linear or broader, the lower once or twice pinnatifid; pappus of 2 or sometimes 3 chaffy awns and of broad truncate laciniate paleæ. — *Dichæta uliginosa*, Nutt. l. c.

Var. TENERA. Smaller form on drier soil, not rarely leaves all entire; paleæ to fix the characters, and as Nuttall was assured, although he unwittingly suppressed the former genus by founding his genus *Stylesia* upon Lagasca's original *Bahia*. *Bahia oppositifolia* is the only species which approaches *Eriophyllum*, and it has the distinguishing characters of *Bahia*. These are, the comparatively lax involucre, open in fruit (or even reflexed when the akenes have fallen), composed of herbaceous or submembranaceous bracts, always distinct and commonly narrowed at base; a small receptacle; and paleæ of the pappus with callous-thickened base or costa: no species is floccose-lanate, although one is canescent-tomentulose. *Eriophyllum* has an erect cupuliform involucre, which does not spread in fruiting, is not rarely gamophyllous at base and sometimes to above the middle, and generally coriaceous rather than herbaceous; the receptacle varies from

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often united into 2 quadrate scales between the two awns. — *Dichæta tenella*, Nutt. l. c.

§ 3. Ptilomeris. Pappus (in one species wanting) of several similar or not very dissimilar paleæ, awned or pointed from the summit or muticous, commonly erose: receptacle not muricate-roughened by the persistent supports to the akenes, as in the preceding sections: bracts of the involucre more or less carinate-saccate at the middle of base, when mature somewhat embracing the subtended akene, at length deciduous with it: leaves all 1–2-pinnately parted into narrow linear or filiform divisions. — *Ptilomeris*, Nutt. Trans. Am. Phil. Soc. vii. 382. *Actinolepis* in part, Benth. & Hook. Gen.

* Rays 6 or 8, oblong, short-exserted: involucral bracts broad: receptacle glabrous, either acutely or obtusely conical: heads small (barely 3 lines high): plants a span high, minutely pubescent, but hardly at all glandular.

B. affinis. Pappus of 8 or 10 oblong or lanceolate paleæ, with laciniate-setulose margins, some or most of them produced into an awn which almost equals the disk-corolla, or in the ray muticous and awnless. — *Ptilomeris affinis*, Nutt. Pl. Gamb. 174. — Lately collected anew, at Los Angeles and San Bernardino, by *Nevin* and *Parish*: probably may hold, as distinct from the next.

B. tenella. Pappus of 6 to 8 short and firm quadrate or broadly cuneate paleæ, the truncate summit denticulate or nearly entire, not surpassing the tube of the corolla. — *Ptilomeris tenella*, Nutt. Pl. Gamb. 173. *Actinolepis* (*Ptilomeris*) *tenella*, Gray, Bot. Calif., mainly. Recently again collected, at Los Angeles, by *Parry*.

* * Rays 10 to 15, elongated-oblong, exserted: involucral bracts oblong-lanceolate: receptacle minutely and sparsely pubescent, acutely conical: plants minutely glandular-pubescent, a span to a foot high, diffuse: perhaps both varieties of one, differing mainly in the pappus.

B. coronaria. *Ptilomeris coronaria*, Nutt. l. c. *Hymenoxys Californica*, Hook. Bot. Mag. t. 3828. *Actinolepis coronaria*, Gray, Bot. Calif., with syn. — Pappus of awn-pointed paleæ.

B. mutica. *Ptilomeris mutica*, Nutt. l. c. *Actinolepis mutica*, Gray, Bot. Calif. l. c., with syn. — Pappus of quadrate-oblong obtuse or truncate paleæ.

plane to conical, and the pappus-paleæ are not costate; all the species are floccose-lanate, and all are restricted to one phyto-geographical region. Moreover, the involucral bracts (as had been remarked in the Botany of California, and is now confirmed in all the species) become carinate-concave at their centre, or where narrow (as in *Eriophyllum stæchadifolium*) wholly concave around the subtended ray-akenes, just in the manner of *Actinolepis*, where it was pointed out by Nuttall and by Bentham. It is thus seen that *Eriophyllum* should include *Actinolepis*, DC., yet not *Ptilomeris*, Nutt. And *Bahia* equally includes *Achyropappus*, HBK., to the great relief of the genus *Schkuhria*, which may thus resume its natural proportions and character. A survey of the species will show that while a costa to the pappus-paleæ, or some equivalent basal thickening, is characteristic of *Bahia*, the extent of its development and even its emergence at the apex are of no consequence. In *Bahia ? nepetæfolia*, Gray, Proc. Am. Acad. v. 184, which Schultz has identified with *B. sinuata*, Less., the larger paleæ are costate-thickened to the apex, but some of the short ones not perceptibly so even at their base. In both these genera, as in other *Heleniecæ*, the pappus is occasionally obsolete or wanting. It is uniformly wanting in *B. chrysanthemoides*, which I wrongly referred to *Villanova*, and was followed by Bentham. But *Villanova* has broad and triangular or triquetrous or obcompressed as well as calvous akenes, the truncate apex with small areola, the lateral angles in the ray commonly margined, sometimes tuberculate-thickened. Under these views the three genera of Lagasca, and the older *Schkuhria* of Roth, become definite, intelligible, and natural. The species, as thus rearranged, are as follows.*

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* ERIOPHYLLUM, Lag.

Neither at Madrid nor in Boissier's herbarium could I obtain any information as to Lagasca's two species of this genus, which in all probability is equivalent to Nuttall's *Trichophyllum*, published two or three years later. But his *E. stæchadifolium* is fairly well made out. Even *E. trolliifolium*, though not identified, may be of the genus, for one or two of the following species sometimes have purple or rose-colored ray-flowers. Our species are these: —

§ 1. ACTINOLEPIS. — *Actinolepis*, DC., Benth. & Hook. Gen. ii. 399, excl. *Ptilomeris*. All annuals and low.

* Heads sessile or nearly so in the forks of the at length much-branched stems or at the summit of the branches, where they are glomerate or leaf-subtended, 2 lines high, yellow-flowered: receptacle flat or barely convex: anther-tips ovate-lanceolate, obtuse: leaves spatulate, commonly 3-lobed or toothed at the summit.

E. MULTICAULE. — *Actinolepis multicaulis*, DC.; Hook. Ic. t. 325; Torr. Bot.

AMBLYOPAPPUS, Hook. & Arn. (*Aromia*, Nutt., *Infantea*, Remy), is near to *Bahia*. It is distinguished mainly by the reduction of the

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Mex. Bound. t. 33. The species was founded on a form, hardly since collected, with most of the disk-flowers infertile, and with their style almost entire.

E. PRINGLEI. Depressed, an inch or two high, flowering from near the base, and forming tufts, loosely and copiously woolly; rays none; flowers all fertile; akenes villous; pappus of about 10 silvery-scarious and oblong-lanceolate pointless paleæ, of rather large size.—On gravelly plains, from the Mohave Desert to Tucson, Arizona, first coll. by *Palmer*, then by *Lemmon*, and recently by *Pringle* and *Parish*. Overlooked until lately in the herbarium, having been confounded with the common pappose variety of *E. multicaule*, and as such distributed by Mr. Pringle.

* * Heads larger (3 or 4 lines high), pedunculate, terminating open branches: rays 5 to 9, oval or oblong, exserted: anther-tips narrow and slender (in the manner of *Burrielia*): receptacle low-conical or high-convex: leaves mostly entire: larger plants 4 or 5 inches high, some species diffuse.

+- Rays about 5, small and inconspicuous: disk-flowers not very many: anther-tips ovate-oblong, obtuse.

E. NUBIGENUM, Greene in litt. Densely white-woolly; leaves lanceolate-spatulate; heads short-peduncled, narrow; involucre of 5 oblong bracts; rays with oval ligule hardly longer than the disk-flowers, yellow; receptacle with a small conical centre; paleæ of the pappus about 10, oblong or narrower, obtuse, somewhat erose, nerveless, obscurely hyaline, half the length of the corolla, one third the length of the akene. — On Cloud's Rest, above the Yosemite, at 9,000 feet, *K. Curran*, from *Greene*.

+- +- Rays 5 to 9, exserted and ample, oval or oblong: anther-tips narrow and slender: receptacle high-convex or obtusely low-conical.

E. WALLACEI. — *Bahia Wallacei* Gray, Pacif. R. Rep. iv. 105. *Actinolepis Wallacei*, Gray, Proc. Am. Acad. ix. 198; with Var. RUBELLA, a form with rose-red rays, instead of the ordinary golden yellow ones.

E. LANOSUM. — *Burrielia lanosa*, Gray, Pacif. R. Rep. l. c. *Actinolepis lanosa*, Gray, Proc. Am. Acad. l. c. Remarkable for its white or rose-colored rays.

§ 2. TRICHOPHYLLUM. — *Trichophyllum*, Nutt. Gen. ii. 166. *Phialis*, Spreng. Gen. 631, but involucre only occasionally gamophyllous. The pappus is always short, of firm and opaque nerveless and pointless paleæ, not rarely much reduced, sometimes obsolete or wholly wanting. Flowers all yellow.

* Suffruticose and cymosely polycephalous species; the head small.

E. STÆCHADIFOLIUM, Lag.— *Bahia stœchadifolia* & *B. artemisiafolia* (Less.) DC. There is hardly a doubt that Lagasca's plant was a fragmentary specimen of this Californian coast species, with only rameal leaves, which are not rarely entire or obsoletely lobed. The " Real del Monte " of Hænke is Monterey, California.

E. CONFERTIFLORUM, *Bahia confertiflora*, DC. With two rather marked varieties. — Var. TRIFIDUM, the *Bahia trifida*, Nutt. l. c., & *B. confertiflora*, Gray, Bot. Calif. — Var. LAXIFLORUM. Like the type, but with loose or more open inflorescence, the heads mostly slender-peduncled; the rays sometimes larger. *Bahia tenuifolia*, DC. ! l. c. Coll. also by *Coulter*.

corollas, both of disk and ray; the absence of ligule to the ray-corollas (if they may be so called); by the conical receptacle; and by some

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* * Herbaceous, commonly if not always perennial, with larger heads usually solitary and conspicuously pedunculate, sometimes more numerous on the branches and even cymosely disposed: recepacle from low-conical to flat, in the same species.

+- Akenes not glandular.

E. CÆSPITOSUM, Dougl. in Lindl. Bot. Reg. t. 1167; the involucre doubtless wrongly figured as gamophyllous, though this is sometimes the case. To this I am obliged to refer all the forms collected under *Bahia lanata* in the Botany of California, along with those under *B. integrifolia* and even *B. arachnoidea*, arranging them under the varieties *latifolium, achillæoides, grandiflorum, leucophyllum*, and *integrifolium*. A slender form is the *B. lanata*, var. *tenuifolia*, Torr. & Gray, Fl. But the *B. tenuifolia*, DC., is quite different, as the original specimen and the description show.

+- +- Akenes, like the corolla-tube, glandular: stems slender, low.

E. GRACILE, the *Bahia gracilis*, Hook. & Arn. This is still known only by Tolmie's specimens, from the Snake River district. It has a loose floccose wool, very narrow leaves, so far as known all entire, an involucre of about 10 oblong bracts, a nearly flat receptacle, slender akenes, the breadth of which is exceeded by the length of the pappus.

E. WATSONI, the *Bahia leucophylla*, in part, of Eaton, Bot. King Exp., wrongly joined to the preceding in Bot. California. This is canescent rather than lanate, fastigiately branched, has leaves of cuneate or spatulate outline, and 3-lobed smaller heads, an involucre of 6 or 7 oval bracts, only 5 or 7 rays, a conical receptacle, shorter and thicker akenes, and a coroniform pappus of truncate and laciniate paleæ decidedly shorter than the width of the akene.

* * * Annuals, with leaves apparently all alternate, small pedunculate heads terminating lax and slender branches, pappus a crown of very small paleæ, or wanting in some flowers, and a conspicuously conical receptacle: the bracts of the involucre are more commonly, but not always, gamophyllous.

E. AMBIGUUM. — *Bahia ambigua* and *B. parviflora*, Gray, Bot. Calif. i. 382, where the synonymy is given. The two supposed species prove to be mere forms of one.

BAHIA, Lag.

The typical species of *Bahia* are suffruticose or perennial. Those of *Achyropappus*, HBK. are annuals, one perhaps rather biennial; and this is the only tangible difference. These species are more naturally placed under a series of sections.

§ 1. Suffruticose or perennial; at least the lower leaves opposite and dissected or lobed: paleæ of the pappus destitute of a distinct costa. — True *Bahia*.

* Anomalous species, imperfectly ligulate, and with irregular very unequal pappus: leaves all opposite and sinuately lobed: flowers apparently white.

B. SINUATA, Less. in Linnæa, vi. 160. *B.* ? (*Anisostemma*) *nepetæfolia*, Gray, Proc. Am. Acad. v. 184. Mexico.

carination without and hollowing within of the axis of the involucral bracts. Weddell's *Schkuhria pusilla*, judging from the figure, must either be of this genus or a species connecting it with *Bahia*.

SCHKUHRIA, Roth. This genus, after elimination of species which belong to *Bahia*, is not so closely related to the latter genus, or to *Achyropappus*, as was supposed. It is completely characterized by its turbinate or obpyramidal involucre, of few bracts with petaloid-margined summit, very few flowers, these either homogamous, or one or two with very short ligule, truly obpyramidal akenes with four equal faces, and also by the habit. The genus falls into two sections; one, equivalent to *Hopkirkia*, DC., has only 3–5-flowered heads, generally homogamous, sometimes a single ray-flower, and the akenes so broadly obpyramidal that the length is little more than double the width of the summit, the angles very densely long-villous, and the faces (also sparsely hairy) are more obviously striate-nerved at maturity: *S. Hopkirkia*, *Wislizeni*, and *Wrightii*, Gray, two of them in Arizona, the other only in Mexico.

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* * Genuine species: paleæ of the pappus obovate or spatulate, scarious and rounded or truncate at summit, and with a callous-thickened base.

+- Rays white: leaves all opposite, much divided.

B. AMBROSIOIDES, Lag. — Chili.

+- +- Rays and disk yellow. — North American.

B. OPPOSITIFOLIA, Nutt. in Torr. & Gray, Fl. *Trichophyllum oppositifolium*, Nutt. Gen. The opaque thickish base of the paleæ of the pappus extends into a kind of costa, which is evanescent below the summit.

B. ABSINTHIIFOLIA, Benth., which passes into its strongly marked variety DEALBATA. Pappus nearly that of *B. ambrosioides*.

§ 2. Herbaceous from a perennial caudex: leaves all alternate and entire, coriaceous or thickish: paleæ of the pappus about 10, linear-lanceolate, hyaline-scarious, with a distinct excurrent or percurrent costa: flowers yellow. — *Schkuhria* § *Platyschkuhria*, Gray, Proc. Am. Acad. ix. 198, & Am. Nat. viii. 213.

B. NUDICAULIS. — *Schkuhria integrifolia*, Gray, l. c. excl. var.

B. OBLONGIFOLIA. Smaller, with leafy stem, narrowly oblong leaves; pappus little shorter than the glabrate akene; its paleæ firmer, smooth, entire-edged. — *S. integrifolia*, var. *oblongifolia*, Gray, l. c.

§ 3. Annuals, the last species perhaps biennial, with palmately or pedately parted or divided leaves: akenes all narrow, quadrangular, mostly hirsute along the attenuate base. — *Achyropappus*, HBK., DC.

* Leaves mainly opposite and the divisions narrowly linear: paleæ of the pappus broad, very obtuse, scarious, with callous-thickened base not extended into a distinct costa. — True *Achyropappus*.

+- Mexican species.

B. ANTHEMOIDES, Gray, Proc. Am. Acad. xv. 40. *Achyropappus anthemoides*, HBK. Nov. Gen. & Spec. iv. 259, t. 390.

B. SCHKUHRIOIDES. — *Achyropappus schkuhrioides*, Link & Otto, Abh. Neu Gew. Gart. Berl. t. 30, 1828. *Schkuhria senecionoides*, Nee, Del. Sem. Hort. Bonn. 1831. — A close congener of the preceding, and near the following.

+- +- North American (Texano-Arizonian) species, which were referred to *Schkuhria* in Proc. Am. Acad. ix. 199, with the rest of *Achyropappus*.

B. BIGELOVII, Gray, Bot. Mex. Bound. 96.

B. NEO-MEXICANA. — *Schkuhria* (*Achyropappus*) *Neo-Mexicana*, Gray, Pl. Fendl.

The section including the older species has narrower akenes, mod-

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98, &c. Paleæ of the pappus thickened in centre to the middle or more. Rays none.

* * Leaves mainly opposite and with simple linear divisions: flowers with short and apparently white rays: paleæ of the pappus lanceolate, acute, and with a complete but not excurrent costa. New Mexico.

B. WOODHOUSEI. — *Achyropappus Woodhousei*, Gray, Am. Acad. vi. 546. *Schkuhria Woodhousei*, Gray, Proc. ix. 199.

* * * Leaves mostly alternate, 2–3-ternately dissected into narrow linear lobes: stems slender, loosely branched: rays none: paleæ of the pappus oblong or broadly lanceolate, traversed by a complete costa, which in the alternate ones is produced into a short bristle or awn, the others muticous or nearly so. South American; nearest *Schkuhria*, but the flowers numerous, involucre broader, and akenes linear-clavate.

B. GILLIESII. — *Schkuhria multiflora*, Hook. & Arn. in Jour. Bot. iii. 322. *S. anthemoides*, Griseb. Pl. Lorent. 139 (*S. pusilla*, id. Symb. Argent. 199, at least in part, excl. syn., but not *S. pusilla*, Wedd. Chl. And. No. 72 of Mandon's Pl. And. Boliv. (I have not 73) is of this species or very near it, certainly is neither *B. anthemoides*, nor *Schkuhria pusilla*, Wedd., which is not a genuine *Schkuhria*, but perhaps an *Amblyopappus*.

* * * * Leaves all or mostly alternate, 2–3-ternately divided or parted, the divisions or lobes from linear-spatulate to obovate: stem simple, comparatively stout, bearing several or rather numerous somewhat corymbosely cymose many-flowered heads at the naked summit: rays conspicuous, yellow: involucre hemispherical: paleæ of the pappus (when present) with distinct costa. S. W. North American species, of closely similar aspect.

+ Pappus of 10 to 14 paleæ, with costa in some evanescent below the apex, in others excurrent: tube of the disk-corollas glandular, but not hirsute; the lobes ovate or oblong and shorter than the dilated throat. Species of *Schkuhria* § *Achyropappus*, Gray, in Proc. Am. Acad. ix. 199.

B. PEDATA, Gray, Pl. Wright. i. 132.

B. BITERNATA, Gray, Pl. Wright. ii. 95.

++ Pappus none: tube of corollas viscid-hirsute: lobes of those of the disk almost equalling the throat and tube together: plant more robust, sometimes 4 feet high.

B. CHRYSANTHEMOIDES. — *Villanova chrysanthemoides*, Gray, Pl. Wright. ii. 96. *Amauria? dissecta*, Gray, Pl. Fendl. 104.

erately hairy or glabrate on the angles, smooth and mostly even on the face; the leaves usually more pinnate; the flowers inclined to be more numerous. As in the preceding section, the species are distinguished mainly by the pappus. Of the two Mexican species, *S. virgata*, DC., comes nearest to *S. Wislizeni*, to which belongs a plant of Galeotti from Oaxaca, which I have as no. 2049, probably an error for "2045." This number Hemsley has referred to *S. abrotanoides*. *S. Bonariensis*, Hook. & Arn., *S. octoaristata*, DC. (to which must belong Mandon's no. 71 and Spruce's 5789), and *S. isopappa*, Benth., appear to be good species.

HYMENOPAPPUS MEXICANUS. Tomento floccoso-canescens, 1–2-pedalis e caudice perenni; foliis aut integerrimis aut pinnatipartitis, lobis oblongo-lanceolatis vel caulinorum linearibus; capitulis laxe subcorymbosis; involucri bracteis ovatis ovalibusque apice tantum petaloideis; corolla (in stirpibus Mexicanis ut videtur sordide alba, in Neo-Mexicanis lutea) lobis parvis fauce campanulata dimidio brevioribus; acheniis secus angulos pubescentibus, faciebus glabellis seu enerviis; pappo minuto (e paleolis minimis) vel obsoleto. — In the higher mountains near San Luis Potosi, Mexico, Sept. 1876, *Schaffner*, seemingly whitish-flowered. New Mexico, in a mountain ravine, near the Mimbres, *Wright*, 1851, a single specimen, reported in Pl. Wright. ii. 94 as *H. flavescens*, var.? Pinos Altos Mountains, *Greene*, July, 1880, and Mogollon Mountains, *Rusby* (no. 179), Sept. 1881. The corollas in Wright's specimens seem to be whitish, but are too old; in Greene's and Rusby's they are clearly yellow. The species is extremely well marked.*

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* In all the other species the two or three nerves on the faces of the akenes are conspicuous; at maturity not rarely as prominent as the five angles. In *H. Mexicanus* they are faintly indicated.

H. FILIFOLIUS, Hook., seems to be the only other truly perennial species, and to include *H. luteus*, Nutt.; for flowers appear to vary from dull white to yellow. The teeth of the corolla are much shorter than the throat; the pappus neither very short nor minute, as originally described, though it may be hidden by the long villosity of the akene.

H. TENUIFOLIUS, Pursh, and H. FLAVESCENS, Gray, are biennials, leafy-stemmed and cymosely polycephalous, with conspicuous pappus, and lobes of the corolla more or less shorter than the throat.

H. ARTEMISIÆFOLIUS, DC., with corolla-lobes fully as long as the throat, villous-pubescent akenes, and a rather conspicuous pappus, belongs rather with

H. SCABIOSÆUS, L'Her., and H. CORYMBOSUS, Torr. & Gray; biennials, with larger limb to the corolla, more white-scarious petaloid and lax involucral bracts, and minutely pubescent akenes, with very short and sometimes obsolete pappus.

CHÆNACTIS FREMONTI. Glabrata vel glabra, pedalis; foliis angusto-linearibus aut integerrimis aut lobis 3–5 instructis; capitulis paucis ultra-semipollicaribus; involucri bracteis crassiusculis acutiusculis, costa prominula; corollis albido-carneis, marginalibus limbo eximie ampliato nunc in ligulam veram 5-lobam expanso discum superante; pappi paleis 4 lineari-lanceolatis corollam subæquantibus costa basilari mox evanida instructis. — Desert of the Mohave and Lower Colorado, *Fremont* (imperfect specimen), *Newberry*, *Parish*, *Lemmon*. A very distinct species, with the aspect rather of *C. Xantiana*, but in character nearer *C. stevioides*, with which it has been somewhat confounded. It is the most radiatiform of all the species, the palmato-ampliate limb of the marginal corollas not rarely developed into a short and broad ligule, with five equal and parallel lobes.

CHÆNACTIS NEVII. This name is given to a yellow-flowered species, imperfectly known by a single specimen collected in Idaho by *Rev. R. D. Nevius*, resembling *C. heterocarpha*, but with obsolete pappus.

CHÆNACTIS THYSANOCARPHA. (§ ACARPHÆA, character amplif. Pappus aut nullus, aut deciduous. Achenia subclavata, complanata, nigricantia. Annuæ, involucro viscido, corollis albidis, marginalibus haud ampliatis.) Humilis, gracilis, viscida-puberula, usque ad capitulum parce foliosa; foliis linearibus angustis integerrimis; involucri 7–10-flori bracteis lineari-oblongis; acheniis clavato-obovatis; pappo corolla dimidio breviore deciduo, e paleis 8–9 tenuibus spathulatis eroso-fimbriatis. — Southern part of the Sierra Nevada, California, probably in Kern Co., at 9,800 feet, *Rothrock*, no. 345.

POLYPTERIS, Nutt. Nuttall's genus, founded on *P. integrifolia*, in our opinion, ought not to have been merged in *Palafoxia*, Lag. It is distinguished by the scarious-membranaceous or petaloid-colored tips of the involucral bracts (in the manner of *Florestina*), and by the division of the limb of the corolla almost down to the filiform tube; moreover the style-branches are not so much like those of *Eupatoriaceæ*. Our species fall under three sections. The first, and nearest to *Florestina*, has middle-sized or small and homogamous heads; involucral bracts herbaceous up to the short sphacelate-colored tips; corolla-limb parted down to the slender tube; akenes oblong-pyramidal; and root annual. Here, *P. callosa* (*Stevia callosa*, Nutt., *Palafoxia callosa*, Torr. & Gray), *P. Texana* (*Palafoxia*, DC., &c.), and the Mexican *P. Lindenii*. The second section, with heterogamous and palmately radiate heads, slender akenes, and an annual root, contains

P. Hookeriana, the *Palafoxia Hookeriana*, Torr. & Gray, Fl., and of Hook. Bot. Mag. t. 5549. The third section, for the original species, *P. integrifolia*, Nutt., has a large homogamous head, a short-campanulate throat between the long lobes and the tube of the corolla, slender akenes, a more imbricated and largely whitish-scarious involucre, and a perennial root.*

ACTINELLA (PLATEILEMA) PALMERI. Depressa, subcæspitosa e caudice multicipiti perenni; foliis confertis pinnatifidis cum caulibus brevibus glabris, lobis subovatis; pedunculis gracilibus subscapiformibus monocephalis; involucri bracteis subovatis ciliatis ligulisque 6–8; acheniis secus nervos 4–5 hirsutis, maturis glabratis. — Peculiar in the genus by the following sectional characters: Involucrum oligophyllum, fere herbaceum, subbiseriale, phyllis ima basi subcoalitis. Receptaculum convexum. Pappi paleæ 4–5, chartaceo-scariosæ, quadratæ, enerviæ, ima basi crassiores, apice truncato laciniatæ nunc fissiles, corollis disci dimidio breviores. Folia impunctata et globulis resinosis destituta, querciformia. — Near Saltillo, State of Coahuila, Mexico, April, 1880, no. 554, coll. *Palmer*.†

ACTINELLA INSIGNIS. *A. chrysanthemoidei* sat similis; radice bienni crasso; caule robusto bipedali ramoso polycephalo; foliis 2–3-pinnatipartitis impunctatis, lobis angusto-linearibus, petiolis magis complanato-dilatatis; pedunculis fistulosis; involucri bracteis linearibus laxioribus; receptaculo convexo; pappi paleis 5 lato-ovatis muticis diametrum achenii haud superantibus. — Coahuila, Mexico, at Lerios, in the mountains east of Saltillo, at 10,000 feet, July, 1880, no. 632,

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* PALAFOXIA FEAYI, Gray, Proc. Am. Acad. xii. 59, is certainly a connecting species, the corolla-lobes being fully half the length of the cylindraceous throat, and the tips of the involucral bracts obscurely sphacelate.

P. linearis, Lag., includes *P. leucophylla*, Gray, Proc. Am. Acad. viii. 291, as a shrubby form, with reduced pappus. In cultivation it produced elongated and excurrently costate pappus-paleæ; and the original species is described as shrubby.

P. latifolia, DC., of Southern Mexico, is apparently unknown to recent botanists, but, having "opposite cordate leaves," it can hardly be of this genus.

† ACTINELLA, Pers., Nutt., name changed, as was at the time thought necessary, from *Actinea*, Juss. *Hymenoxys*, Cass., DC. *Actinella, Hymenoxys*, and a part of *Cephalophora*, Benth. & Hook. I have insisted upon the maintenance and full development of this genus in Plantæ Fendlerianæ, Plantæ Wrightianæ, and later in Proc. Am. Acad. xiii. 373. It has now a good number of species, which fall into three natural sections, the first of which is new: —

§ 1. PLATEILEMA. Involucrum oligo- et platyphyllum: receptaculum convexum: pappi paleæ (4–5) quadratæ, truncato-laciniatæ, fissiles.

A. PALMERI, vide supra. Northern Mexico.

Palmer. Thoroughly distinct from the *Actinea chrysanthemoides*, HBK.; the heads and rays as large as in Kunth's figure of that species, larger than in any specimens of it we possess.

HELENIUM THURBERI. *H. ooclinio* affinis, pariter annuum; paleis pappi breviusculis ovatis obtusis muticis; foliis lineari-lanceolatis inte-

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§ 2. EUACTINELLA. Involucrum polyphyllum, simplex, nempe, e bracteis gradatim 2–3-seriatis subæqualibus discretis herbaceis vel submembranaceis: receptaculum sæpius conicum vel hemisphæricum: pappi paleæ sursum sæpius angustatæ vel aristatæ.

* Suffruticosa, caulescens. Am. Merid.

A. HETEROPHYLLA, Juss., sub *Actinea*, Pers. *Cephalophora heterophylla* & *C. radiata* (?), Less. Certainly belongs here rather than to *Cephalophora.* Our specimens are incomplete.

* * Annua, caulescens, integrifolia; receptaculo conico. Am. Bor.

A. LINEARIFOLIA, Torr. & Gray, Fl. ii. 383, ubi syn.

* * * Perennes, Am. Bor., caudice multicipiti, raro simplici.

+– Scaposæ, monocephalæ, plerumque integrifoliæ.

A. SCAPOSA, Nutt., var. LINEARIS, Nutt.

A. ACAULIS, Nutt. — Var. GLABRA. *A. glabra* & *A. Torreyana*, Nutt.

A. DEPRESSA, Torr. & Gray, Pl. Fendl. 100, cum var. PYGMÆA.

+–+– Caulescentes, mono–oligocephalæ, integrifoliæ.

A. ARGENTEA, Gray, Pl. Fendl. 100.

A. LEPTOCLADA, Gray, Pacif. E. Exp. iv. 107.

+– +– +– Caulescentes, humiles, mono–oligocephalæ, sæpius megacephalæ, foliis plerisque divisis.

A. BRANDEGEI, T. C. Porter; Gray, Proc. Am. Acad. xiii. 373.

A. GRANDIFLORA, Torr. & Gray, in Bost. Jour. Nat. Hist. Soc. v. 110.

* * * * Biennes vel annuæ, Mexicanæ, pleio–megacephalæ; caulibus robustis foliosis; foliis omnibus 1–3-pinnatipartitis. — *Hymenoxys*, Benth. & Hook. Gen. l. c.

A. INSIGNIS. Vide supra.

A. CHRYSANTHEMOIDES, HBK. Nov. Gen. & Spec. iv. 298, t. 411, sub *Actinea.* The developed receptacle in all our specimens is high and narrowly conical. The preceding species has probably been confounded with this; but the very different pappus should at once distinguish it.

§ 3. HYMENOXYS. Involucrum pl. m. duplex, e bracteis coriaceis erectis, extimis sæpissime aut basi aut altius cupulato-connatis: receptaculum conicum. Herbæ caulescentes, annuæ, biennes, vel raro perennes. — *Hymenoxys*, DC. excl. sp. ult.

* Capitulum homogamum; involucro utroque 7–8-phyllo, bracteis latis obtusis. — *Hymenoxys*, Cass. Amer. Merid.

A. ANTHEMOIDES, Gray, Pl. Wright. i. 122, &c. *Hymenoxys anthemoides*, Cass. *H. Hœnkeana*, DC. Prodr. ?

gerrimis imisve latioribus raro laciniatis; capitulis multo minoribus globoso-ovatis fuscis; receptaculo lato-ovato; ligulis nullis.—S. Arizona, *Coulter* (359, distributed as of Californian collection), *Thurber* (346, wrongly referred to *H. puberulum* in Bot. Mex. Bound.), *Pringle*

* * Capitulum heterogamum radiatum. Am. Bor. et Mex.

+– Ramosæ, pleiocephalæ; foliis (sp. ultima excepta) plerisque 1–3-pinnati- vel ternati-partitis.

++ Pappi paleæ majusculæ in acumen saltem aristiforme productæ.

A. ODORATA, Gray, Pl. Fendl. 101. E radice annua diffusa; foliorum segmentis filiformibus mollibus; capitulis parvulis sparsis; bracteis involucri externi 7–8 basi tantum coalitis. — *Cephalophora anthemoides*, Less. ex DC. *Hymenoxys odorata*, DC. Prodr. v. 661; Deless. Ic. iv. 42.

A. BIENNIS, Gray, Proc. Am. Acad. xiii. 373. E radice bienni erecta, 1–2-pedalis; foliorum segmentis linearibus rigidulis; capitulis subcymosis majusculis hemisphæricis; involucri laxioris bracteis externis 12–14 vix carinatis; ligulis totidem angusto-cuneatis. — *A. Richardsonii*, var. *canescens*, Eaton, Bot. King, 175; Gray, Bot. Calif. i. 394, forma nana cinerea.

A. RICHARDSONII, Nutt. E caudice multicipiti perennis, spithamæa ad pedalem, fastigiatim ramosa; foliis rigidulis 1–2-ternatopartitis, segmentis filiformi-linearibus, petiolis radicalibus in axillis lanosis; capitulis parvulis; involucro externo 6–9-angulato e bracteis crasso-carinatis infra medium cupulato-connatis; ligulis cuneatis. — *Picradenia Richardsonii*, Hook. Fl. i. 317, t. 108.

++ ++ Pappi paleæ breviores muticæ: caules erecti 1–2-pedales e radice perenni, vel bienni.

A. VASEYI, Gray, Proc. Am. Acad. xvii. 219. Subglabra; capitulis majusculis fastigiato-cymnosis; involucro campanulato, externo e bracteis 7–9 carinatis longe in cupulam 7–9-dentatam interius æquantem connatis; pappi paleis oblongis tenuibus obtusis vel obtusiusculis corolla disci dimidio brevioribus; segmentis foliorum linearibus saltem trifidis. — Still known only by the few specimens collected in New Mexico by *George R. Vasey*.

A. COOPERI, Gray, Proc. Am. Acad. vii. 394. Puberula, 2–3-pedalis e caudice ut videtur perenni, superne paniculato-ramosa; capitulis sparsis; involucro fere hemisphærico, externo e bracteis 6–10 basi connatis; pappi paleis latis obtusissimis apice erosis hyalinis corolla disci plus dimidio brevioribus; foliis inferioribus biternatim quinatimve superioribus tantum 3–5-partitis in segmenta fere filiformia. — S. E. California, *Cooper*, an incomplete specimen, in which the pappus seemed to be of firm texture. S. W. Arizona, on high slopes, Tanner's Cañon, *Lemmon*, complete specimens: pappus thin and hyaline.

A. RUSBYI. E radice lignescente (ut videtur bienni ?) ultrapedalis, stricta, glabra, apice fastigiatim ramosa, polycephala; foliis rigidulis linearibus, radicalibus elongatis angustis cum caulinis inferioribus aliis integerrimis aliis tripartitis, superioribus omnino integerrimis; capitulis parvis (lin. 3 altis) confertis; involucro externo e bracteis 7–8 subulato-lanceolatis ima basi tantum connatis; ligulis totidem lin. 2–3 longis quadratis; pappi paleis 5 quadratis seu latissime cuneatis truncatis rigidulis prorsus enerviis tubum proprium corollæ

(137, was referred to *H. ooclinium*): a well-marked and apparently always rayless species.

GAILLARDIA MEXICANA. Primo intuitu *G. lanceolatæ* sat similis, sed microcephala, humilior; radice perenni; involucro basi calloso; corollis disci dentibus brevi-oblongis obtusis; villis achenii parcioribus; fimbrillis receptaculi perplurimis setiformibus achenio cum pappo suo adæquantibus.— Northern Mexico, *Palmer*, in the Sierra Madre, south of Saltillo, no. 725; also in a dwarf and subcaulescent form at Lerios, in the mountains east of Saltillo, no. 726. Collected in the same region, but without the root, by Gregg, no. 113, 160, also in the mountains near San Luis Potosi, by Schaffner, Sept., 1876, no. 259. Moreover it is no. 374 of coll. *C. Wright*, in 1849, on the Rio Frio, in S. W. Texas, which was wrongly referred to *G. pulchella.*

GAILLARDIA COMOSA. *G. simplici*, Scheele, affinis (§ *Guntheria*, *Agassizia*, Gray & Engelm.), humilis; foliis omnibus radicalibus 1–2-pinnatipartitis vel paucis laciniatis; scapo spithamæo; involucro triseriali parvulo; ligulis breviusculis fertilibus; acheniis longissime denseque villosissimis, villis pappi paleas oblongo-lanceolatas costa breviter excurrente aristulatas corollam disci subæquantes fere tegentibus; receptaculi fimbrillis brevissimis mollibus.—Northern Mexico, near Saltillo, April, 1880, no. 721, *Palmer.* The long villi of the achenium are found to be inserted over its whole surface in *G. simplex* and *G. pinnatifida* no less than in the present species, in which they so abound as to form a dense pellet.

SARTWELLIA MEXICANA. Foliis angustissime linearibus; pappo e paleis 4–5 angusto-oblongis apice truncato fimbriolatis cum aristis alternantibus gracillimis longioribus, omnibus ima basi tantum connatis. — Northern Mexico, near Monclova and San Lorenzo de Laguna, south of Parras, *Palmer*, 683, 687. A very interesting accession to a genus which was supposed to be monotypic. The pappus is as if the cupule of *S. Flaveriæ* were resolved into four or five paleæ, with

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disci haud superantibus.—Grassy slopes of the Mogollon Mountains, New Mexico, *H. H. Rusby*, Sept., 1881.

+– +– Simplex vel subsimplex e caudice perenni, monocephala; foliis angustissime linearibus rigidulis fere semper integerrimis impunctatis; involucro utroque 12–14-phyllo consimili, vel interno e bracteis magis attenuato-acuminatis, iis externi ima basi parum connatis; pappi paleis circa 10 subulato lanceolatis sensim aristato-acuminatis corollam disci fere æquantibus.

A. BIGELOVII, Gray, Pl. Wright. ii. 97, & Bot. Mex. Bound. 99.—New Mexico, first coll. by *Dr. Bigelow.* Connects *Hymenoxys* with *Euactinella,* and with the section *Dugaldea* of *Helenium.*

the interposition of as many delicate and scabrous awns, the latter of nearly the length of the cylindrical akene.

FLAVERIA CHLORÆFOLIA, Gray, Pl. Fendl. 88. Among the abundant specimens of this well-marked species in Palmer's Mexican collection (682, 2083), one was noticed in which most of the flowers had a pappus of four oblong and entire paleæ!

POROPHYLLUM FILIFOLIUM. Caulibus e radice perenni gracillimis simpliciusculis rigidulis monocephalis; foliis omnibus alternis filiformibus plerisque pollicaribus, summis parvis; involucro brevi-campanulato 8–9-phyllo, bracteis lato-oblongis obtusissimis crassiusculis flores (multos) purpurascentes æquantibus; tubo corollæ fauce subinfundibuliformi cum dentibus ovatis 2–3-plo breviori; acheniis gracilibus apice haud angustatis pappo subparco barbellulato parum longioribus. — Northern Mexico, in the Sierra Madre, south of Saltillo, *Palmer*, 688, mixed in the distribution with a little *Thelesperma subsimplicifolium.* Belongs to the section which contains *P. scoparium* and *P. amplexicaule;* but with more dilated throat to the corolla. The last-named two species are remarkable for the slender corolla, of which the greater part is a narrow tubular throat, raised on a decidedly shorter proper tube, and surmounted by very short and blunt teeth. In this they agree with *Chrysactinia.*

POROPHYLLUM ERVENDBERGII. *P. ruderali* var. *elliptico* sat similis, multo minus; foliis omnibus oppositis oblongis; capitulis gracillimis 10–15-floris; involucro semipollicari. — *P. ellipticum*, var. Gray, Proc. Am. Acad. v. 184. — Wartenberg, Mexico, *Ervendberg*, no. 75.*

DYSODIA and the genera nearly allied to it are of difficult limitation. A renewed study of nearly all the species concerned obliges me to modify the view adopted by Bentham in the Genera Plantarum,

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* A few Mexican species may be noted as follows: —

POROPHYLLUM VIRIDIFLORUM, DC., to which Hartweg's no. 147 has rightly been referred, comprises *P. Lindenii*, Schultz Bip., if Hemsley has correctly identified Seemann's with Hartweg's plant.

POROPHYLLUM SEEMANNI, Schultz Bip. Bot. Herald, 308. Seemingly a variety of this, with narrower and mostly attenuate-acute or acuminate leaves (the base tapering into a petiole) is a plant from "Mexico, *Tate*," long ago received from duplicates of Herb. Hooker. By the elongated corolla tube it belongs to the same group with the broad-leaved petiolate species.

POROPHYLLUM OBTUSIFOLIUM, DC., we know only from the specimens of Mendez. It appears to be truly perennial, has the involucre either bright violet-purple or sometimes greenish, the leaves mainly tapering somewhat into a petiole; the limb of the corolla deeply 5-parted into oblong-lanceolate lobes, and

and to recall the reference I had formerly made, and he had accepted, of *Lebetina* to *Adenophyllum*. This was the result of giving prominence to the double pappus of unlike form. But this character breaks down in respect to *Lebetina cancellata* and *Dysodia porophylla*, DC., which are likely to prove mere forms of one species, and would carry some genuine *Hymenathera* to *Adenophyllum*. A better limitation of the genera is as follows: —

ADENOPHYLLUM, Pers. (*Willdenovia*, Cav.), with involucre and calyculate bractlets of *Eudysodia*, habit between that and *Tagetes*, disk-corollas at least sometimes unequally cleft into long and narrow linear lobes; and a double pappus, each of five paleæ; the outer short and truncate; the inner elongated-lanceolate, entire or with a pair of subulate teeth at apex where the strong costa is excurrent into a short awn. The filiform style-branches are hispidulous above, at summit abruptly produced into a hispidulous setaceous appendage. The single species, *A. coccineum*, Pers.

DYSODIA, Cav., and chiefly of Lagasca, the distinguishing character of which is the multisetose polyadelphous pappus, i. e. the 10 to 20 paleæ are resolved each into numerous (at least 9 or 10) long capillary bristles. In one species only, *D. cancellata*, is there a different outer series, the short paleæ of which are usually entire, yet occasionally setiferous. The involucre is not so diagnostic; for, although mostly calyculate with accessory bractlets, and gamophyllous only at base, or not at all, in *D. serratifolia* (which can in no wise be referred to *Hymenatherum*) it is even that of *Tagetes*.

HYMENATHERUM, Cass, connected with the preceding by *Aciphyl-*

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about the length of the narrow throat (i. e. of the portion of tube above the insertion of the stamens), which again is only equalled by the proper tube.

POROPHYLLUM GRACILE, Benth. Bot. Sulph. 29. To this probably belongs no. 449 of Coulter's Mexican collection, a depauperate form.

POROPHYLLUM LINARIA, DC. (*Cacalia Linaria*, Cav. Ic. iii. 257). To this we should refer Coulter's no. 448, Parry & Palmer's 502, Schaffner's 263, and with little doubt Hartweg's 146. It is distinguished from the next by its perennial root, thickish more sessile leaves, &c.

POROPHYLLUM COLORATUM, DC. The annual species with thinnish narrow leaves, and violet-purple involucres, with little doubt including *P. tagetioides*, DC., *Kleinia tagetioides* and *K. colorata*, HBK., well figured under the latter name in Mart. Amœn. Monac. 23, t. 15. It comes from Schaffner, Bilimek, &c., and is Bourgeau's 584, 3091.

POROPHYLLUM SUFFRUTICOSUM is a name which should be adopted for a South Brazilian species which seems to have been taken for Mexican, if — as I suppose — it is *Kleinia suffruticosa*, Willd., and also of Lodd. Bot. Cab., t. 1561, *P. linifolium* (mainly), and *P. decumbens*, DC.

læa, — a genus which I extended in Pl. Fendlerianæ, and again in Pl. Wrightianæ, and to which must now be added *Adenophyllum Wrightii* of the latter work, and even *Thymophylla*, Lag., — is distinguished from *Dysodia* by its pappus of at most 1–5-aristate paleæ, or else some or even all of them muticous; and the simple campanulate involucre is wholly gamophyllous. In this genus we find all gradations between a simple and a double pappus. The branches of the style are truncate, and either with or without an apiculation or an obscure cone.

The species of these genera may be arranged and characterized as in the foot-note.[*]

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[*] DYSODIA (*Dyssodia*), Cav.

§ 1. GYMNOLÆNA, DC. Involucrum campanulatum, sæpius modo *Tagetis* alte gamophyllum basi fere nudum: styli rami ex apice truncato-subpenicillato subito tenuiter appendiculati: receptaculum alveolato-dentatum, pubescens: capitula solitaria pedunculata, majuscula: folia præter lobulos stipuliformes indivisa, opposita.

D. SESSILIFOLIA, DC. Prodr. v. 641. *Hymenatherum sessilifolium*, Hemsl. Bot. Biol. Centr.-Am. ii. 241, referred to that genus on account of a note in Benth. & Hook. Gen. Pl., but it is like *Hymenatherum* only in the gamophyllous involucre. Style-appendages slender, nearly setiform.

D. INTEGRIFOLIA. Gracilis, glabra; foliis angusto-lanceolatis adpresso-serrulatis basi attenuatis subpetiolatis basi utrinque lobulo subulato-setaceo instructis (inferioribus ignotis); involucro (semipollicari) bracteolis paucis parvis lineari-subulatis calyculato, bracteis propriis angusto-lanceolatis infra medium tantum coalitis; ligulis aureis; styli fl. herm. ramis apiculo tenui brevi terminatis. — District of Chiapas, Mexico, along streams in the mountains, no. 784, *Ghiesbreght*. Leaves not half the size of those of *D. serratifolia*, which is no. 519 of Ghiesbreght, and which is said to have "fleurs rouge tres vif." In this species they are obviously yellow.

§ 2. EUDYSODIA. Involucrum campanulatum vel hemisphæricum basi calyculato-fulcratum, bracteis inferne tantum coalitis vel liberis: styli rami aut præcedentis (*D. porophylla* & *cancellata*), aut plerumque sensim in appendicem gracilem tenui-subulatam producti: corollæ dentes sæpius angusti: receptaculum pl. m. fimbrilliferum: capitula majuscula, pedunculata, ramos apice nudos terminantia: herbæ perennes nunc suffruticosæ, oppositifoliæ et alternifoliæ. — *Dysodia* § *Eudysodia*, *Bœbera* pro parte, *Bœberoides*, et gen. *Clomenocoma* (Cass.), DC.

* Receptaculum eximie setoso-fimbrilliferum: achenia pubescentia: capitula speciosa: folia omnia opposita. — *Clomenocoma*, Cass. *Comaclinium*, Scheidw. & Planchon. *Clappia* pro parte, Benth.

+- Bracteæ accessoriæ involucri ovatæ.

D. GRANDIFLORA, DC. Prodr. v. 640. "Folia ovali-lanceolata, argute serrata, acuminata; involucro bracteis ovatis subdentatis acuminatis cincto"; pappo

TAGETES, Tourn., is so natural that no question of its limitation has been raised. Its involucre varies from oblong-campanulate to tubular or to ovate and ventricose. The akenes are angulate or compressed,

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fere semipollicari, setis pauciusculis rigidulis. — This is not identical with *Clomenocoma montana* of Bentham, as he (in Addenda to Pl. Hartw. 351) has suggested.

D. SQUAMOSA. Folia trifoliolata, foliolis ovatis petiolulatis serratis: bracteæ accessoriæ *scariosæ*, apiculato-acuminatæ vel muticæ, propriis vix breviores: pappi paleæ setis numerosis mollibus. — *Dysodia appendiculata*, Schultz Bip. in Bot. Herald, non Lag. — Northern part of Mexico, *Gregg*, no. 1061. *Seemann*, 1991.

+ + Bracteæ accessoriæ angustæ.

D. APPENDICULATA, Lag. Nov. Gen. & Spec. 29. Folia pinnata paucijuga: involucri bracteæ accessoriæ numerosæ, subulatæ vel setaceo-attenuatæ. — *Aster Americanus*, etc. Houst. Rel. t. 18. *A. aurantius*, L. *Clomenocoma aurantia*, Cass. Dict. ix. 416, lix. 66; DC. l. c. *Clappia aurantiaca*, Benth. Ic. Pl. xii. 3, t. 1104; unless, indeed, the involucre is quite correctly delineated in the figure as to the pluriserially imbricated bracts. If so, it is a peculiar but otherwise similar species.

D. MONTANA. Folia ovata seu ovato-lanceolata, indivisa et serrata, summisve inciso-pinnatifida: involucri bracteæ accessoriæ paucæ, lineares. — *Clomenocoma montana*, Benth. Pl. Hartw. 86; Hook. Bot. Mag. t. 5310, excl. syn. DC. Prodr. *Comaclinium aurantiacum*, Scheidw. & Planchon, Fl. Serres, t. 756. *Dysodia grandiflora*, Hemsl. Bot. Biol. Centr.-Am. ii. 219, non DC. — Guatemala and Nicaragua.

* * Receptaculum brevissime fimbrilliferum, pubescens, vel subalveolatum: bracteæ accessoriæ tenuiter subulatæ vel setaceæ: achenia glaberrima vel minute puberula, pappo breviora: plantæ plerumque glaberrimæ, ramosæ, caulibus basi sublignosis vel frutescentibus.

++ Folia omnia opposita, trifoliolata, petiolis petiolulisque gracilibus.

D. SPECIOSA, Gray, Proc. Am. Acad. v. 163. Lower California, *Xantus*.

++ ++ Folia omnia vel plera alterna, laciniato-pinnatipartita, raro indivisa.

= Styli rami ex apice obtuso subpenicillato subito tenuiter appendiculati: foliorum lobi et involucri bracteæ accessoriæ seta tenuissima protracta terminati. Spec. duæ, Mexicanæ, pappo tantum diversæ, in priore (*Lebetina*, Cass.) anomalo.

D. CANCELLATA. Pappus duplex, exterior e paleis 10 brevibus oblongis vel obovatis coriaceis integerrimis apice quandoque denticulatis vel paucisetuliferis. — *D. Porophyllum*, Willd. Enum. 900, non Cav. *Lebetina cancellata*, Cass., DC. *Bœbera Porophyllum*, Less. *Adenophyllum Porophyllum*, Hemsl. Biol. Centr.-Am., mainly. — This appears to be usually more robust than the following, more conspicuously radiate, and the paleaceous portion of the inner or ordinary pappus is more conspicuous and firmer than in the following. But the two probably had a not remote common ancestry.

D. POROPHYLLA, Cav. Anal. Cienc. vi. 334; DC. Prodr. v. 639. *Pteronia Porophyllum*, Cav. Ic. iii. 13, t. 225, discoid form. *Bœbera Porophyllum*, HBK. *Ade-*

hardly at all striate; the pappus is composed of very few and usually coriaceous paleæ; some of which are apt to be aristiform, but none setiferous.

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nophyllum capillaceum, DC. l. c. 638, unless that should be the preceding. *A. Porophyllum*, Hemsl. l. c., in part.

= = Styli rami in appendicem elongato-subulatam hirsutam sensim producti: folia vix setigera.

D. POROPHYLLOIDES, Gray, Pl. Thurb. 322, & Bot. Calif. i. 397. Caules basi lignosi: folia 3–5-partita, segmentis angustis dentibusque cum bracteis involucri externi subulato-acutatis nec setiferis. — Southeastern California and Arizona.

D. COOPERI, Gray, Proc. Am. Acad. ix. 201, & Bot. Calif. l. c. Caules basi minus vel vix lignosi: folia omnia alterna, brevia, ovata et sublanceolata, arcte sessilia, subspinuloso-dentata, nonnulla basi utrinque lobo parvo stipuliformi instructa: capitulum pollicare, involucro 20–30-phyllo cum bracteis accessoris parvis. — Southeastern California.

§ 3. BŒBERA, DC. excl. sp. Capitula minora; involucro fere præcedentis; bracteis accessoriis subfoliaceis veras subæquantibus: styli rami fl. herm. cono brevi nunc obtuso superati: corollæ dentes breves ovati: receptaculum puberulum: achenia puberula: herbæ sæpius pubescentes, foliis oppositis pinnatipartitis, segmentis angustis plerumque dentatis vel incisis.

* Herbæ perennes (an semper?), capitulis mediocribus ramos terminantibus longius pedunculatis, ligulis exsertis conspicuis.

D. TAGETIFLORA, Lag. l. c.; Gray, Pl. Wright. i. 114. Caules elongati: pedunculi superne incrassati: involucrum glabellum, bracteis accessoriis lanceolato-subulatis acutis. — *Bœbera fastigiata*, HBK. Nov. Gen. & Spec. iv. 148. *B. tagetiflora*, Spreng. Syst. DeCandolle confounded this with his *D. appendiculata*, at least in his herbarium, and referred the synonymous names to his *D. fastigiata*, which otherwise is *D. chrysanthemoides*. And Hemsley omits the species, taking only partial note of the remarks in Pl. Wrightianæ. To this belongs no. 2560 of Bourgeau.

D. PUBESCENS, Lag. l. c. Humilior, mox diffusa: pedunculi sursum vix incrassati: involucrum sæpius pubescens, bracteis accessoriis oblongo- seu lineari-spathulatis obtusis. — *Aster pinnatus*, Cav. Ic. iii. 6, t. 212. *Dysodia integerrima*, Lag. l. c., a form with narrow subentire leaf-segments. *Bœbera incana*, Lindl. Bot. Reg. t. 1602. *Dysodia incana* & *Clomenocoma pinnata*, DC.

* * Herba annua, ramosissima, usque ad capitula parvula foliosissima; foliis majus divisis; ligulis parvis inconspicuis. — *Bœbera*, Willd.

D. CHRYSANTHEMOIDES, Lag. l. c., cum syn. DC. Prodromi. *D. fastigiata*, DC. l. c., excl. syn. — Mississippi Valley to Mexico.

§ 4. BŒBERASTRUM. Involucrum laxius, depresso-hemisphæricum, simplicissimum, e bracteis 8–9 obovatis membranaceis margine subscariosis ima basi subincrassatis, accessoriis plane nullis: ligulæ conspicuæ rotundatæ: corollæ disci lobis longiusculis: styli rami cono brevi acuto superati: pappi setæ ratione

TAGETES LEMMONI. Fere glaberrima, 2–3-pedalis; caulibus strictis superne subfastigiatim ramosis paniculato-polycephalis; foliis omnibus oppositis; foliolis 5–7 lanceolato- seu elliptico-linearibus æqualiter ser-

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paleæ breviusculæ, lateralibus inferioribus brevissimis: herba annua, humilis, glabra, diffusa, foliis alternis lineari-pinnatipartitis.

D. ANTHEMIDIFOLIA, Benth. Bot. Sulph. 29. — Lower California, *Hinds, Dr. Streets.*

HYMENATHERUM, Cass. 1817, 1818. *Hymenatherum* (excl. § 2), *Dysodia* § *Aciphyllæa, Gnaphaliopsis,* DC., cum *Thymophylla,* Lag. & *Lowellia,* Gray.

§ 1. ACIPHYLLÆA, DC. (sub *Dysodia*), Gray, Pl. Wright. i. 115. Paleæ pappi simplicis 18–20, angustæ, superne in setas capillares 3–5 dissolutæ: suffrutex foliis integerrimis aceroso-filiformibus oppositis, capitulis subsessilibus.

H. ACEROSUM, Gray, l. c. *Dysodia ? acerosa,* DC. *Aciphyllæa acerosa,* Gray, Pl. Fendl. 88.

§ 2. DYSODIOPSIS, Gray, Pl. Wright. l. c. excl. spec. Paleæ pappi simplicis 10, rigidæ, achenio breviusculo haud longiores, lanceolatæ, corolla disci breviores, aliæ apice subulato-acuminatæ, aliæ apice fissæ trisubulatæ: herba foliis alternis pinnatifido-dentatis, capitulis folioloso-calyculatis.

H. TAGETOIDES, Gray, l. c. *Dysodia tagetoides,* Torr. & Gray, Fl. ii. 361. Texas.

§ 3. EUHYMENATHERUM. Pappi paleæ 10–20, aut omnes aut interiores 1–3-aristatæ, aristis corolla disci vix brevioribus: capitula sæpissime pedunculata, basi parum bracteolata vel nuda.

* Ligulæ paucæ, brevissimæ, inconspicuæ: pappus rigidus, duplex, utroque 10-paleaceo, paleis exterioris truncato-obtusis, interioris triaristatis: herba annua, erecta, glabra; capitulis brevi-pedunculatis bracteolis paucis setaceis subtensis.

H. NEO-MEXICANUM. *Adenophyllum Wrightii,* Gray, Pl. Wright. ii. 92. — New Mexico, found only by Wright. Certainly of this genus.

* * Ligulæ exsertæ, conspicuæ: pappus minus rigidulus, aristis capillaribus vel tenui-setiformibus.

+ Herbæ annuæ, glaberrimæ (nunc pedunculis minutissime glanduloso-puberulis), humiles, diffuso-ramossimæ, floribundæ; pedunculis breviusculis; foliis mollibus pinnatipartitis in segmenta sublineari-filiformia obtusa prorsus mutica, superioribus alternis.

H. POLYCHÆTUM, Gray, Pl. Wright. i. 116. Pappi paleæ 18–20, angustissimæ, inæquales, plerumque uniaristatæ et bi- (raro 4-) aristulatæ, exteriores minores magis attenuatæ uniaristulatæ. — Texas and New Mexico.

H. DIFFUSUM, Gray, l. c. Pappi paleæ 10 brevi-lanceolatæ, in aristam 3–4-plo longiorem inter setulas vel dentes breviter aristulatos 2 productæ, et 2–5 parvæ simplicissimæ subuliformes in serie externa imperfecta. — Mexico, *Tate,* in herb. Hook., only specimen yet known to me.

H. TENUIFOLIUM, Cass. Dict. xxii. 313. Pappi paleæ 10, breves, oblongæ, 2–3-aristatæ, aristis lateralibus centrali dimidio brevioribus tenuioribus, raro setulis 2 adjectis, additæ 2–3 minimæ setiformes inconspicuæ. — I had conratis (lin. 2–4 latis, majoribus sesqui-bipollicaribus) ; pedunculis breviusculis gracilibus subulato-bracteolatis ; involucro oblongo-campanulato subturbinato glandulis ovalibus oblongisve maculato ; ligulis 6–8 semi-

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nected this with *H. tenuilobum*, DC. ; but having two or three akenes and pappus of the original in herb. Jussieu, I can nearly identify it with a plant collected by Schaffner in the " Valley of Mexico, no. 81," given to me by Schultz Bip., under the name of *H. diffusum*. The two, and also the next, appear to be quite alike except in the pappus. Cassini's plant probably was not Chilian.

H. NÆI, DC. Prodr. v. 642. Pappi paleæ 10, oblongæ vel obovatæ apice bifidæ, lobis muticis, aut omnes aut 6–7 aut 5 interiores longe tenuiter aristatæ. — Gray, Pl. Wright. l. c. Also *H. bœberoides*, Gray, l. c. This is no. 517, coll. *Parry & Palmer* (referred to *H. diffusum* in Hemsley's Bot. Biol. Centr.-Am.), at least as to my specimen. I seem not to have no. 513.

+ + Herbæ perennes vel subperennes radice gracili, glabræ vel glabellæ; pedunculis sparsis longiusculis, foliis plerisque alternis rigidiusculis mucrone acutissimo vel setuliformi apiculatis : pappi paleæ 10, consimiles, omnes 2–3-aristatæ.

H. WRIGHTII, Gray, Pl. Fendl. 89. Subpedale, sæpius erectum; foliis integerrimis vel paucilobatis angusto-linearibus vel subfiliformibus; capitulis majusculis. — Texas.

H. TENUILOBUM, DC. l. c. Diffusum; foliis pinnatipartitis, lobis brevibus subulato-filiformibus ; pappo rigidulo, aristis palea vix longioribus. — *H. tenuifolium*, Gray, Pl. Wright, i. 118, non Cass. — Texas and adjacent Mexico.

+ + + Herbæ perennes basi plerumque suffruticulosæ ; pedunculis elongatis filiformibus ; foliis rigidioribus pinnato-3–7-partitis, segmentis filiformibus seu acerosis setuloso-apiculatis : pappus 10-paleaceus ;

++ Paleis omnibus aristatis vel subulato-acuminatis lanceolatis, exterioribus brevioribus sæpius integerrimis, interioribus setuloso-bidentatis : plantæ puberulæ, segmentis foliorum setaceo-acerosis.

H. BELENIDIUM, DC. Prodr. vii. 292. *H. Candolleanum*, Hook. & Arn. Jour. Bot. iii. 320. — The South Chilian species, from Mendoza, *Gillies*. And to this belongs a plant in Hænke's herbarium, at Prague, ticketed "*H. Næi*" by De Candolle.

H. THURBERI. Facie *H. pentachæti*, sed fere herbaceum ; pappi paleis parum biseriatis angusto-lanceolatis, minoribus aristato-subulatis. — *H. tenuifolium* var. ? Gray, Pl. Wright. ii. 93. — Borders of W. Texas and Mexico, near El Paso, &c., *Wright* (1408), *Thurber* (746) ; and a seeming form of the same was collected by *Parry* in 1878.

++ ++ Pappus plane duplex, utroque 5-paleaceo scarioso ; paleis exterioris brevioribus spatulatis seu oblongis apice obtusis vel erosis muticis, interioris lanceolatis oblongisve inter dentes 2 subulatos nunc aristulatos uniaristatis : suffruticulosæ, cinereo-pubescentes vel glabellæ, humiles, diffusæ, Texano-Mexicanæ.

= Oppositifoliæ, floribundæ.

H. HARTWEGI, Gray, Pl. Wright, i. 117. *H. Berlandieri*, Benth. Pl. Hartw. 18, non DC.

pollicaribus; corolla disci lobis fere imberbibus; pappi paleis brevibus inæqualibus, 1–3 subulatis cæteris 2–3-plo longioribus. — Huachuca Mountains, S. Arizona, *Lemmon*, 1882. A shorter-leaved form, apparently of this species, was scantily collected in the Santa Catalina Mountains, in 1881.†

= = Subalternifoliæ, capitulis sparsis.

H. PENTACHÆTUM, DC. (Gray, Pl. Wright. l. c.), with *H. Berlandieri*, DC. Prodr. v. 642.

H. TRÉCULII. Laxe diffusum vel decumbens, subherbaceum, fere glabrum: foliis crassiusculis pectinato-pinnatipartitis, lobis brevibus lineari-subulatis, rhachi latiore. — H. n. sp.? no. 13, Gray, Pl. Wright. i. 116. — S. E. Texas, *Trécul*. Too little known.

+ + Herba annuæ, depressæ, floccoso-lanosissima, *Micropi* modo; foliis mollibus plerumque alternis spathulatis integerrimis; capitulis brevi-pedunculatis vel sessilibus; ligulis brevibus ovalibus. — *Gnaphaliopsis*, DC.

H. GNAPHALIOPSIS, Gray, Pl. Fendl. 90 (*gnaphalodes*) & 115, Pl. Wright, l. c. *Gnaphaliopsis micropoides*, DC. Prodr. vii. 258. — Texano-Mexican.

§ 4. THYMOPHYLLA. Pappi paleæ 5–12, truncatæ, muticæ (nunc 3–4 interiores breviter aristatæ vel aristiformes!), subcoriaceæ, quandoque in cupulam connatæ. — *Thymophylla*, Lag. Nov. Gen. & Spec. 25; Gray, Pl. Fendl. 91, & Pl. Wright. i. 119; Benth. & Hook. Gen. (*Thymophyllum*).

* Fruticuli *Hymenatheris* acerosifoliis simillimi, sed albo-tomentosi: ligulæ sæpius nulli. — *Thymophylla*, Gray, l. c.

H. SETIFOLIUM. *Thymophylla setifolia*, Lag. l. c.; Gray, Pl. Wright. l. c. t. 7, fig. 10, 11. — Northern Mexico. On this plant Lagasca's long unknown and imperfectly characterized genus was founded, a little earlier than *Hymenatherum*, which nevertheless it could not now well supersede. It was becoming evident that the separate genus could not stand, when it was discovered that in some of the specimens of no. 516, *Parry & Palmer*, there is an inner series of 3 or 4 aristate or aristiform paleæ, the plants mingled with and otherwise not distinguishable from those with the ordinary pappus of 5 or 6 truncate paleæ.

H. GREGGII. *Thymophylla Greggii*, Gray, l. c. t. 7, forma radiata. Pappus cupuliformis, truncatus. — Texano-Mexican.

* * Annua, glaberrima, pluriradiata, facie *H. tenuifolii*, etc. — *Lowellia*, Gray.

H. AUREUM. *Lowellia aurea*, Gray, Pl. Fendl. 89, Pl. Wright. i. 118. — S. Colorado and W. Texas.

† TAGETES, Tourn. — The following are the principal species: —

§ 1. *Pectidiformes*, DC., integrifoliæ, radiatæ.

T. LUCIDA, Cav. *T. florida*, Sweet, Brit. Fl. Gard. ser. 2, t. 35. *T. Schiedeana*, Less. in Linnæa, ix. 271.

§ 2. *Macrocephalæ*, DC., pinnatifoliæ, capitulis multifloris, ligulis exsertis.

* Laxe ramosæ, radice perenni, foliolis serratis, dentibus vix setigeris.

T. LEMMONI; vide supra.

T. PARRYI, Gray, Proc. Am. Acad. xv. 41. Puberula, laxe ramosa, 1–3-

PECTIS. Mr. Bentham remarked, in Gen. Pl. ii. 412, that the sections of *Pectis* proposed in Pl. Wright. i. 83, might probably be recast with advantage. The genus is very natural; and, although two or

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pedalis; ramis monocephalis, capitulo majusculo in pedunculo nudo sæpius elongato apice turbinato fistuloso; foliis oppositis et alternis; foliolis ovalibus oblongisve ligulis 8 latis ultra-semipollicaribus; corollæ lobis intus barbatis, dentibus patentissimis. — Hills southeast of San Luis Potosi, Mexico, *Parry & Palmer*, 504. Now in cultivation; a handsome but late- and sparsely-flowered species.

T. ZYPAQUIRENSIS, Humb. & Bonpl. of New Granada and Ecuador, to which the above has some affinity, although said by Bonpland to be annual, is probably perennial. A specimen of coll. *André* is ticketed "Frutex dumosus."

T. ELLIPTICA, Smith, of Ecuador or Peru, is unknown as to duration, and may also be perennial.

T. PAUCILOBA, DC. A suffruticose Chilian species, with small linear leaflets, very little known.

* * Annuæ, foliolis lanceolatis seu linearibus sæpissime pinnatifido-dentatis, dentibus fol. juniorum plerumque setigeris: pappi paleæ nonnullæ aristiformes, demum ultra involucrum exsertæ.

T. PATULA, L.; Sims, Bot. Mag. t. 150, etc. *T. erecta*, L.; Lam. Ill. t. 684, etc., grosser form, enlarged by cultivation, the peduncle ventricose-dilated under the thick head. *T. corymbosa*, Sweet, Brit. Fl. Gard. t. 151; Hook. Bot. Mag. t. 3830; the latter a more slender and normal form. *T. remotiflora*, Kunze in Linnæa, xx. 23. To this doubtless no. 3204 of *Bourgeau* is to be referred; while 583 goes rather to the following. The lines between the two are difficult to draw.

T. TENUIFOLIA, Cav. Ic. ii. 54, t. 169; HBK. Nov. Gen. & Spec.; Hook. Bot. Mag. t. 2045, perhaps originally from Mexico, rather than "Peru." *T. peduncularis*, Lag. & Rod. 1802; DC., etc.; smaller forms, with shorter and more laciniate leaflets. *T. lunulata*, Ort.? *T. elongata*, Willd. Spec. iii. 2127? *T. signata*, Bartl. Ind. Sem. Gœtt. 1837, & DC. Prodr. vii. 292; Rev. Hort. 1863, t. 11, a floribund variety of cultivation.

T. SUBVILLOSA, Lag., is a still unrecognized Mexican species.

§ 3. *Leptocephalæ*, DC., pinnatifoliæ, annuæ, capitulis plerumque angustis, ligulis paucis inconspicuis raro nullis.

The Mexican species known to us appear to be the following: —

* Foliola vel segmenta serrata vel incisa.

T. FŒTIDISSIMA, DC. — Well characterized by its numerous oblong-linear and obtuse leaflets, serrate with very many teeth; short-peduncled narrow heads, mostly clustered at the summit of the branches, and the one or two awns of the pappus fully the length of the akene. This, rather than *T. coronopifolia*, Willd., may be *T. clandestina*, Lag.

T. SUBULATA, Llave & Lex., Nov. Veg. Descr. i. 31. *T. multiseta*, DC., and probably *T. oligocephala*, DC. *T. Wislizeni*, Gray, Pl. Fendl. 92. — Known by the 1-2-pinnately divided leaves, with subulate mostly long-setiferous divisions or lobes, long and filiform peduncles, and awns of the pappus very much longer three genera have been made from it, it seems incapable of division even into well-marked subgenera. The principal available characters are given by the pappus; but this is apt to be reduced, or even to disappear, in some specimens of almost every group. *Pectidopsis* was founded on an awnless state of a not uncommonly 1–2-awned species. *Pectidium*, with the anomalous *Pectis imberbis* (of similar habit, but a perennial), along with the two species of *Heteropectis*, which are annuals with the ordinary *Pectis* habit, may be associated by the character of the two or three corneous awns. In *P. punctata* these are not always completely smooth and naked; an occasional upturned denticulation has been observed. Allowing that in every section the pappus may in the same species be sometimes obsolete or reduced to a crown, the genus may be fairly well disposed of under three sections: —

1. EUPECTIS. Pappus paucipaleaceus, vel pauci-aristatus aristis setiformibus, nunc ex aristis et paleolis paucis vel definitis constans, plerumque uniserialis.

2. PECTOTHRIX. Pappus (saltem fl. disci) multisetosus, inæqualis, plerumque biserialis, setis interioribus validioribus quandoque aristiformibus inferne sensim latioribus nec vero paleaceis.

(even the paleæ longer) than the akenes. No. 688 of Fendler's Venezuelan collection is a very similar plant, except for the shorter peduncles, and may be probably referred to the same species. The paleæ and awns of the pappus are not rarely connate into a tube.

* * Segmenta foliorum angustissima, integerrima, vel hinc inde lobulata.

T. CORONOPIFOLIA, Willd. Enum. Suppl. 60 (sine char.); Jacq. f. Eclog. i. 118, t. 80. *T. angustifolia*, HBK. Nov. Gen. & Spec. iv. 194. There are cultivated specimens in the Berlin herbarium, and the original of Humboldt at the Paris Museum. In both, as I learn from comparisons kindly made for me, the longer paleæ of the pappus are about one third the length of the akene; the "*longiores*" in Kunth's description is therefore a mistake for *breviores*. I possess a single indigenous specimen, collected by Graham in Mexico, which belonged to the herbarium of John Stuart Mill.

T. FILIFOLIA, Lag. Nov. Gen. & Spec. 28. *T. multifida*, DC. The name of Lagasca may somewhat confidently be restored for this low species, intermediate between the preceding and the following, which better deserves the name. Like it, the longer paleæ of the pappus are strictly aristiform. The divisions of the leaves are more numerous, shorter, and less slender; the heads not so slender, mostly very short-peduncled, and disposed to be clustered.

T. MICRANTHA, Cav. Ic. iv. 31, t. 352. This is an anisate-scented little species, paniculately much branched, slender-peduncled (except as to the later heads); the attenuate-filiform leaves with only 3 or 5 divisions, or some of the lowest and uppermost entire. It reaches the United States.

3. Pectidium. Pappus bi–tricornis, nempe ex aristis paucissimis (1–4) validis corneis sæpius divergentibus.

Of Eupectis we have on the southern borders of the United States three species of the paleaceous division *P. prostrata*, Cav., of Mexico, *P. ciliaris*, L., and *P. linifolia*, Less., of the coast of Florida, these having come from the West Indies. Of the pauciaristate divisions, we have two short-pedunculate species which extend into Mexico; *P. tenella*, DC., and *P. angustifolia*, Torr. (the latter more commonly wanting the one or two awns, and having a paleaceous crown; and a peculiar long-peduncled species, *P. filipes*. This cannot be *P. Taliscana* or *Jaliscana*, Hook. & Arn., having very obtuse involucral bracts and only one to three (commonly two) much more rigid awns to the pappus, shorter than in any other *Eupectis*.

The West Indian species I have not the means of elucidating. But it may be doubted if *P. prostrata* is among them; and, judging from Lessing's characters, his *P. Sieberi* and *P. serpyllifolia*, with broad paleaceous pappus, cannot have been correctly referred by Grisebach to *P. humifusa*. His *P. Carthusianorum* appears to have been collected by C. Wright in San Domingo (280), and by Fendler (1975) in Venezuela. *P. Plumieri*, Griseb. is of the pauci-(3–10-)aristate division and "*P. floribunda*, Rich." is probably rightly referred to it; for an unnamed specimen from "Cuba, *La Sagra*," belongs here. *P. Swartziana*, Less., and of Griseb., I have not seen; but *P. pratensis*, Wright, in Sauvalle Fl. Cubana, 81, which has a pappus of few awns and of interposed paleolæ, probably belongs to it. *P. humifusa*, Swartz, or the plant taken for it by Lessing and by Grisebach (*Lorentea humifusa*, Less., perhaps also his *L. sessiliflora*), is well marked by its aristiform paleæ (rather than awns), 10 or 12 in number, and a few added delicate setæ outside, which, if considered to form an external series, gives Lessing's character of *Lorentea*. Moreover, it may well be the original *Lorentea*, Lag. (*L. prostrata*), "pappus paleaceo-setaceus, paleis pluribus inæqualibus," which is said to have the facies of *P. prostrata*, Cav. Note, however, that Swartz described his *P. humifusa* as "aristis 5 paleaceis basi laciniatis margine serratis."

Mexican species of *Eupectis* are: —

Pectis prostrata, Cav., depressed, with sessile heads. Schultz Bip. has sent, from a collection by Schaffner, an unpublished *P. Schaffneri*. This will probably prove to be a very narrow-leaved form of *P. prostrata*, the involucre of only 3 or 4 bracts.

Pectis fasciculiflora, DC., collected only by Hænke, is quite unknown to us.

PECTIS BONPLANDIANA, HBK., diffuse, with pedunculate heads; awns of the pappus rising from broad and short paleæ which are apt to split away, or with one or two awnless paleæ. We have it from coll. Siemann, Liebmann, and Ervendberg; the last, in Proc. Am. Acad. v. 181, inadvertently named *P. Seemanni.* That species, of Schultz in Bot. Herald, Bentham has found to be *Oxypappus scaber.*

PECTIS UNIARISTATA, DC. This, or a plant quite agreeing with the character, we have from Manzanilla, on the western coast of Mexico, collected by Xantus. The heads are slender-peduncled, and the akenes are surmounted by a cupuliform crown and a slender setiform awn, this wanting in some outer flowers.

Var. HOLOSTEMMA. Parvula; corona pappi paullo majore, arista prorsus nulla. — *P. filipes*, Schultz Bip. in coll. Liebm. no. 394, non Gray. This is neither *P. filipes*, nor is that *P. Jaliscana* (by error *Taliscana*), Hook. & Arn., to which Hemsley, following Schultz's naming, has referred it. — Consoquitla, *Liebmann.*

PECTIS ANGUSTIFOLIA, Torr. (*Pectidopsis*, DC.), with subsessile or short-peduncled heads, and a squamellate-coroniform pappus, not rarely with one or two short awns to some of the flowers, extends into Mexico as far as San Luis Potosi (*Schaffner*, 325, *Parry & Palmer*, 519, not cited by Hemsley).

Coming now to species with aristiform pappus and no crown : —

PECTIS CAPILLARIS, DC., from the southern part of Mexico, with 5-aristate pappus (presumably no paleæ or crown), is not identified.

PECTIS JALISCANA, Hook. & Arn. Bot. Beech. 296 (printed *Taliscana*, and the habitat "Jalisco" printed "Talisco"), needs to be compared with the preceding. It is not *P. filipes*, as Hemsley would have it, following an indication by Bentham. The bristles of its pappus, in two or three flowers which I have examined, though only three in number, are much more slender, and the paleaceous squamellæ are conspicuous. The published character runs "pappo radii et disci setis 3–6 aristatis basi dilatatis paleisque paucis brevissimis."

PECTIS TENELLA, DC., is a 3–6-aristate species with the aspect of *P. angustifolia*, but destitute of crown or squamellæ. Laredo is on the U. S. side of the Rio Grande; but Berlandier gathered it also in Tamaulipas, as did Gregg.

PECTIS BERLANDIERI, DC. More diffuse in the inflorescence than the foregoing (although in no. 1096 of Parry & Palmer this is glomerate); involucral bracts acuminate; pappus of 5 or 6 setiform awns, or fewer in the ray-akenes. C. Wright collected apparently a tall form of the same species in Nicaragua.

PECTIS DIFFUSA, Hook. & Arn., from the specimens of Panama, *Seemann*, which are all we possess, appears to differ from *P. Berlandieri* only (therefore too slightly) in more numerous bristles to the pappus, in the ray 5, in the disk 9 and 10. There are sometimes one or two external setulæ. So it comes nearest to *P. elongata*, and makes a transition to the next section. *P. Hænkeana*, Schultz (*Lorentea*, DC.), may be the same. Perhaps also no. 967 of Gregg's collection, which, however, is more clearly of the *Pectothrix* section, the disk-pappus of about 10 long, as many intermediate, and a few small and short exterior setæ.

PECTOTHRIX. This name is preferred to that of *Lorentea* for the multisetose or multiaristate section, because the latter, as originated by Lagasca, and one species (same as Lagasca's) of Lessing's genus, belong to *Eupectis* in the present arrangement; although, notwithstanding the words of the character, Lessing's two original species belong here. The U. S. species are only *P. papposa*, Gray, remarkable for the rather scanty and barbellate or almost plumose bristles of the pappus; and *P. longipes*, Gray; both confined to near the Mexican border, but not yet detected beyond it; for 3159 of Berlandier, referred to the latter by Hemsley, belongs to the next species.

The Mexican species which we can make out are as follows: —

PECTIS CANESCENS, HBK. Nov. Gen. & Spec. iv. 263, t. 293. *Lorentea canescens*, & *satureioides*, Less. in Linn. v. 135, & vi. 718. *L. auricularis*, *canescens*, & *satureioides*, DC. Prodr. v. 102. *Pectis auricularis*, *canescens*, & *satureioides*, Schultz Bip. Bot. Herald, 225, nomina tantum. *P. latisquama*, Schultz Bip. in herb.; Gray, Proc. Am. Acad. v. 181, var. *Berlandieri*. *P. longipes*, Hemsley, l. c., quoad Pl. Berlandier, 3159. With hardly a doubt, all these are of one species, with character of ray-pappus quite variable, more so than in the published accounts. For all our specimens (Berlandier, Ervendberg, Schaffner, Wright from Nicaragua, Parry & Palmer 1067, the latter by oversight cited under *P. Berlandieri* by Hemsley) have a pappus in the ray like that of the disk, or a little more scanty, but inclined to be deciduous. The breadth of the involucral bracts varies much. Kunth's specific name is oldest in the genus; otherwise that of *satureioides* would be preferred. The pappus is wholly setiform, about 5 innermost and longer bristles more awn-like, being distinctly stouter; the numerous others all capillary; outer ones shorter and more delicate.

PECTIS LIEBMANNI, Schultz Bip. l. c.; Hemsley, l. c. — San Augustino, *Liebmann*, 467. A most distinct species, canescent with soft pubescence, almost tomentose. Pappus nearly of the preceding, about five of the inner bristles stronger and more aristiform.

PECTIS ELONGATA, HBK. l. c., t. 392, a common South American species, is not known from Mexico.

Of Western Central America, *P. tenuifolia* and *P. subsquarrosa* (names by Schultz in transferring from *Lorentea*) are of this group.

The West Indian *P. Cubensis*, Grisebach, is of this section, with habit somewhat of *P. humifusa*, and the stouter inner bristles of the pappus slightly broadened downward.

PECTIDIUM. The four species here associated are *P. Coulteri*, Gray, of Arizona, and *P. multiseta*, Benth., of Lower California, forming section *Heteropectis*, Gray, Pl. Wright., — low annuals, peculiar for having the corneous pappus awns retrorsely barbed in the way of *Bidens*, — *P. punctata*, Jacq. (*Pectidium*, DC.), annual, with smooth corneous awns, and leaves almost destitute of setæ, — and *P. imberbis*, Gray, a rather tall Arizonian perennial, with no setæ to the leaves, rigid and paleaceous smooth awns and 2 or 3 short rigid paleæ, the awns not rarely obsolete. The two latter accord well in habit.

Anthemideæ.

ARTEMISIA KLOTZSCHIANA, Bess. Revis. Artem. herb. Berol. in Linnæa, xv. 107, is the name of the Mexican species left unnamed by Hemsley, Bot. Biol. Centr.-Am. ii. 231. Coll. *Schaffner*, 275; *Parry & Palmer*, 528, 529, both from San Luis Potosi. Besser described only an incomplete specimen, collected by Schiede, the heads destitute of flowers. As Besser states, it is an annual species, with leaves dissected into small filiform lobes. It belongs to the *Abrotanum* section, and the small heads are many-flowered, ripening numerous akenes.

The following are additions to the North American species: —

ARTEMISIA WRIGHTII. *Abrotanum*, microcephala, pube minuta cinerea vel canescens, pedale, foliosissima; foliis in segmenta 5 vel 7 angustissime linearia mox revoluto-filiformia integerrima pinnatipartitis; panicula stricta virgata; capitulis confertis; involucro demum glabrato. — Plains of S. Colorado and New Mexico, Wright (no. 1279, referred to in Pl. Wright. ii. 98, under the "forma tenuifolia" of *A. Mexicana*), *Greene*, *Palmer*, *Brandegee*, and *Rothrock* (no. 539), who states that it is regarded as a peculiar species.

ARTEMISIA FRANSERIOIDES, E. L. Greene in Bull. Torrey Club, x. 42. A robust species of the *A. vulgaris* type, imperfect specimens of which have been referred to *A. discolor*. It is essentially glabrous throughout, for the coarsely 1–2-pinnately parted leaves, although whitened beneath, have no evident tomentum; the heads are comparatively large and broad, in loose panicles. First collected in the mountains of S. Colorado by *Gunnison*, later by *Rothrock* in those of S. E. Arizona, and by *Greene* in S. New Mexico.

Artemisia Bolanderi. *Seriphidium*, between *A. trifida* and *A. cana*, referred to the former in Bot. Calif. i. 405: the characters indicated in the subjoined conspectus of the group.*

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* ARTEMISIA, § *Seriphidium*, Besser.

The North American species, which have much needed revision, have been arranged for the Synoptical Flora of North America essentially as follows: —

1. *Anomalous species*, mainly herbaceous, tall, with ample compound panicles, and heads more or less nodding in anthesis. — S. California.

A. Parishii, Gray, Proc. Am. Acad. xvii. 220. Has the anomaly of sparsely arachnoid-villous akenes.

A. Palmeri, Gray, Proc. Am. Acad. xi. 79. Anomalous in having paleæ on the receptacle, subtending most of the flowers.

2. *Sage-brush*, low shrubs or suffruticulose plants of the interior dry regions, canescent; the heads erect even when young.

* Foliose-spicate; the heads solitary and sessile in the axils and all surpassed by the mostly 3-parted rigid and almost acerose leaves.

A. rigida. *A. trifida*, var. *rigida*, Nutt. Trans. Am. Phil. Soc. n. ser. vii. 398. — Only sterile specimens were known to the discoverer; the flowering plant, collected by Cusick in Eastern Oregon, confirms Nuttall's conjecture that it is a peculiar species.

* * Thyrsoid-paniculate, &c.; at least the upper heads or clusters exceeding the subtending and not rigid leaves.

+ Heads comparatively small and few-flowered, mostly oblong.

A. arbuscula, Nutt. l. c. Dwarf, with stout woody base but slender flowering branches, along which the heads, subtended by small leaves or bracts, are spicately or paniculately scattered: involucre 5–9-flowered: leaves on the main stem cuneate and dilated, 3-lobed or parted, and lobes sometimes again 2–3-lobed. There are two forms, both represented among Nuttall's specimens; one with more campanulate 7–9-flowered involucre; in the other this is oblong, 4–5-flowered, and the outer bracts much shorter; this occasionally occurs with a more compound and slender polycephalous panicle.

A. tridentata, Nutt. l. c. Larger, 1 to 6 feet high: leaves cuneate, 3-toothed or 3-lobed at the truncate summit, only the uppermost cuneate-linear and commonly entire: involucre 5–6-flowered; its outermost bracts short and ovate, usually tomentose-canescent. Far the most common and wide-spread *Sage-brush* or *Sage-wood*. — Var. angustifolia. Leaves all narrow; lower spatulate-linear and barely 3-toothed at the rounded apex; upper entire and linear: heads rather smaller, exactly of *A. tridentata*, while the foliage is nearly that of *A. trifida*, except that it is not trifid. — Arid plains, S. Idaho and W. Nevada to the Mohave Desert and the southern borders of California.

Senecionideæ.

PSATHYROTES PILIFERA. *P. annuæ* et *P. ramosissimæ* affinis, pube quasi intermedia, sed foliis lato-rhomboideis basi cuneatis semper integerrimis pilis longissimis arachnoideis multi-articulatis ciliatis; involucro oblongo, bracteis fere linearibus erectis; acheniis (immaturis) oblongis pilis brevibus hirsutis. — S. Utah, near Kanab, *Mrs. A. P. Thompson, Parry.*

LEPIDOSPARTUM SQUAMATUM. *Tetradymia* (*Lepidosparton*) *squamata,* Gray, Proc. Am. Acad. ix. 207, & Bot. Calif. i. 408. I find it impossible to retain this singular shrub in *Tetradymia;* and the regularly imbricated chartaceo-scarious bracts, along with the acutish style-tips, give good generic characters.

CACALIOPSIS NARDOSMIA. This striking plant, which I at first named *Cacalia Nardosmia,* in Proc. Am. Acad. vii. 361, and later (viii. 631) followed Benth. & Hook. Gen. Pl. ii. 247, in referring to *Adenostyles,* finds its wholly appropriate position in the subtribe *Tussilagineæ,* between *Petasites,* of which it has the habit, and *Luina.* The style is not altogether that of *Eupatoriaceæ,* although approaching it, and the flowers are yellow. The anthers are quite entire at base, but otherwise as in *Luina.* While the specific name indicates

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A. TRIFIDA, Nutt. l. c. Low: leaves 3-cleft and 3-parted, the lobes and the entire upper leaves narrowly linear or at summit barely spatulate-dilated: involucre 3–9-flowered, its outermost bracts from oblong to lanceolate.

+− +− Heads somewhat larger and broader, 7–14-flowered: inner involucral bracts more scarious: stems low, less woody.

++ Pubescence looser, furfuraceous-tomentose: inner bracts of the involucre narrow-oblong.

A. BOLANDERI. Leaves all narrowly linear, less than a line wide, acutish, entire, or with one or two small and slender apical lobes: heads numerous, densely glomerate-paniculate, 14-flowered. — Mono Pass, in the Sierra Nevada, *Bolander.* Confounded in the Botany of California with *A. trifida.*

++ ++ Pubescence fine and close throughout: involucral bracts broad.

A. CANA, Pursh. Silvery-canescent: leaves narrow, entire, or rarely one or two acute teeth or lobes: heads 5–9-flowered, canescent. — Saskatchewan to Montana and south to the Parks of Colorado.

A. ROTHROCKII, Gray, Bot. Calif. i. 618; Rothrock in Wheeler Rep. vi. 366, t. 13. Includes also specimens referred to *A. trifida* in Bot. Calif. Cinereous: leaves comparatively short-cuneate and obtusely 3-lobed, or the upper linear and entire, sometimes all lanceolate and entire: heads larger, 9–12-flowered: bracts of involucre all ovate or oval, glabrate. — California, in the eastern and southern portion of the Sierra Nevada, *Rothrock, Bolander.* S. Utah, *Ward, Parry.*

the resemblance of the herbage to that of *Petasites* (*Nardosmia*) *palmata*, the generic name here applied suggests its likeness to the original *Cacalia* of Tournefort, and in part of Linnæus, which is *Adenostyles* of Cassini.

CACALIA, L. Gen. ed. 4, 362 (excl. his own *Kleinia*, *Porophyllum*, Vaill., and Tournefort's *Cacalia*, which is *Adenostyles*). *Cacalia* (chiefly) and *Psacalium*, DC. I cannot think that the homogamous white-flowered *Senecioneæ* with deeply-cleft corollas, which Linnæus referred to *Cacalia* — and which, after restoring *Kleinia*, L., DeCandolle properly made the staple of that genus — should be combined with *Senecio*. The genus seems to be quite as good as *Emilia*, *Notonia*, *Gynura*, and some others which have been kept up. In view of the vastness of *Senecio*, it were better to limit it even somewhat arbitrarily, and, as in the analogous case of *Asteroideæ*, to make use of color; which on the whole coincides with habit, and also with geographical distribution. *Cacalia* essentially belongs to Central and North America and to Northern Asia. Only the following are more or less known to me by specimens: —

§ 1. N. E. Asian, with one North American species: corolla-lobes only half the length of the throat.

C. HASTATA, L., and some other species with still fewer-flowered paniculate heads. It is probably by a mistake that *C. hastata* has been attributed to Sitka or any part of North America. Specimens of the plant so referred by the Russian botanists, collected on Sitka, prove to belong to *Prenanthes hastata*, the *Sonchus hastatus* of Lessing, *Nabalus alatus*, Hook. Fl. Bor. Am. i. 294, t. 102.

C. SUAVEOLENS, L., of Eastern North America, with many-flowered cymosely disposed heads.

C. ACONITIFOLIA, Miq. (*Syneilesis*, Max.), with cymose heads.

§ 2. Atlantic North American species with cymosely disposed about 5-flowered heads: corolla-lobes very much longer than the throat, i. e. limb 5-parted: receptacle commonly with one or two fleshy fimbrillæ projecting from the centre. — § *Conophora*, DC.

* Leaves pedately-nerved.

C. RENIFORMIS, Muhl. in Willd. Spec. Pl.

C. ATRIPLICIFOLIA, L. Doubtless includes *C. gigantea*, Nees & Schauer.

C. DIVERSIFOLIA, Torr. & Gray. Perhaps only a form of the foregoing; but the corolla-lobes are only moderately longer than the campanulate throat.

* * Leaves 3–7-nerved or triplinerved, not lobed.

C. FLORIDANA. Has been mistaken for a form of *C. tuberosa* and for *C. diversifolia.* Accords with the latter in having the corolla-lobes little longer than the oblong-campanulate throat; is stout, with thickish leaves (apparently under the influence of brackish water); these ovate or oval, obtuse, all acute or contracted at base, coarsely and obtusely dentate; stem strongly striate-angled. — Coast of E. Florida, *Palmer*, *Chapman.*

C. OVATA, Ell., perhaps of Walter; but the brief character accords better with the next.

C. TUBEROSA, Nutt. Gen., &c.

C. LANCEOLATA, Nutt. To this or to *C. diversifolia* may be referred Walter's *C. hastata.*

§ 3. Mexican species, and one Arizonian, with cymosely disposed or rarely paniculate heads.

* Corolla-lobes linear, very much longer than the throat, i. e. limb 5-parted to near and sometimes quite down to the proper tube.

+– Akenes (as in all the preceding) very glabrous; but the herbage of these more or less pubescent.

C. DECOMPOSITA, Gray, Pl. Wright. ii. 99. *Senecio Grayanus*, Hemsl. Biol. Centr.-Am. Bot. ii. 241. The only species within the limits of the United States. Has small and few-flowered heads, and decompound-dissected leaves.

C. CERVIARIÆFOLIA, DC. *Senecio cerviariæfolius*, Hemsl. l. c. t. 51. Certainly very unlike a *Senecio;* and it is not surprising that it has been taken up as a genus, first by Zuccarini (as *Odontotrichum*), next by Kunze (*Sciadoseris*), and lastly by myself (as *Mesoneuris*); and it was left for Bentham to ascertain that it was a *Cacalia* of DeCandolle. The pappus is unusually rigid.

C. SINUATA, Llav. & Lex., DC., which Hemsley, in the work above cited, has named *Senecio calophyllus.* A well-known Mexican species, with pappus less rigid.

C. PELTATA, HBK. Nov. Gen. & Spec. iv. t. 361. *Psacalium peltatum*, Cass., DC. *Senecio peltiferus*, Hemsl. l. c. Has a soft and white pappus and large heads.

C. TABULARIS. *Senecio tabularis*, Hemsl. l. c. 248. This we know only from the specimen of Bourgeau, no. 2926; a species with thin peltate leaves and paniculate few-flowered heads of small size.

C. PACHYPHYLLA, Schultz Bip. in Seem. Bot. Herald, 310. *Senecio sclerophyllus*, Hemsl. l. c. Remarkable for its radical leaves, large, thick, reniform, reticulate-venulose.

+- +- Akenes hirsutely pubescent or papillose.

C. SCHAFFNERI. Facie *C. sinuatæ;* caule superne pedunculisque cymarum pube furfuracea cinereis; foliis radicalibus excentrice peltatis circumscriptione orbiculatis 5-partitis, segmentis bis trilobatis, sinubus obtusissimis latis, lobis oblongis; capitulis confertis (lin. 4–5-longis); involucro 5–7-phyllo 5–7-floro parum bracteolato; ovario cinereo-pubescente. — Near San Luis Potosi, *Schaffner*, no. 294, and an imperfect specimen also collected by *Parry*. Possibly this is the little-known *C. radulæfolia*, HBK.; but the leaves of that should be more finely dissected, and the peltate character is not noted.

C. CIRSIIFOLIA, Hook. & Arn. Bot. Beech. 437. *Senecio cirsiifolius*, Hemsl. l. c. I have only an imperfect authentic specimen.

C. CHIAPENSIS. *Senecio Chiapensis*, Hemsl. l. c. 338. A singular species, "growing in forests" according to the collector, thin-leaved, the lower leaves pinnately 5-lobed; heads in numerous paniculate cymes, remarkably small, only 3 lines high, 7–8-flowered; akenes puberulous. It was communicated from this herbarium to that of Kew, under another name. S. Mexico, *Ghiesbreght*.

* * Corolla-lobes of the same length as the throat: akenes glabrous: pappus-bristles barbellulate-clavellate at tip! — *Pericalia*, Cass.

C. CORDIFOLIA, HBK. l. c. 168, t. 360. *Pericalia cordifolia*, Cass. Dict. xlviii. 459. *Senecio cardiophyllus*, Hemsl. l. c. 237. Kunth was evidently mistaken in his supposition that the flowers are yellow.

* * * Corolla-lobes not more than half the length of the throat: ovaries glabrous.

C. PARASITICA, Schultz Bip. in herb. Kew & herb. Gray, cited by Hemsley, who characterizes it under the name of *Senecio parasiticus*.

C. PENDULIFLORA. *Senecio subpeltatus*, Schultz Bip. in Seem. Bot. Herald, 311, non Steud. The leaves of this remarkable species are very decidedly peltate.

* * * * Ambiguous species: corolla merely 5-toothed, flesh-colored: habit rather of *Erechthites*, but the heads homogamous.

C. PRENANTHOIDES, HBK. Nov. Gen. & Spec. iv. 167. *C. Tolúccana*, DC. Prodr. vi. 325. *Senecio runcinatus*, Less. in Linn. vi. 410, therefore *Erechthites? runcinata*, DC. l. c. 295, but has no external female flowers. *Senecio mulgediifolius*, Schauer in Linn. xix. 733? *S. eximius*, Hemsl. l. c. 239. Bourgeau's no. 1086, cited by Hemsley under his (not DeCandolle's) *Erechthites runcinata*, and 1087, under *Senecio eximius*, appear to be the very same; and this author has overlooked Humboldt's plant, to which all appear to belong.

C. RUNCINATA, HBK. l. c.; DC. l. c. 327. *Senecio cirsioides*, Hemsl. l. c. 238. I have only Liebmann's specimen, no. 393. It is nearly related to the preceding, but is low, woolly, and bears fewer and larger heads.

§ 4. West Indian, of peculiar habit, shrubby: corolla-lobes much longer than the throat.

C. DISCOLOR, Grisebach, Cat. Pl. Cub.

SENECIO. The study of the North American species for the Synoptical Flora brings in a few changes in nomenclature, mostly relating to forms which have been named for collectors without revision of the whole ground; also a few new forms. Mere notes or indications may suffice for the present.

SENECIO RUGELIA. *Rugelia nudicaulis*, Shuttlew. in coll. Rugel, taken up by Chapman, is a good *Senecio*, not so near *Arnica* as might at first be thought.

SENECIO WHIPPLEANUS is the *S. eurycephalus*, var. *major*, Gray in Pacif. E. Exped. iv. 111, a species to rank next to *S. Mendocinensis*.

SENECIO HARTWEGI, Benth., belongs to a peculiar Mexican group, and was collected in a glabrous form, within our limits in S. Arizona, in 1882, by *Lemmon*.

SENECIO HUACHUCANUS, sparingly collected by *Lemmon*, at the same time, is a new species related to *S. triangularis* and *S. Andinus*. It has smaller heads than the latter, and broader leaves, the upper ones all partly clasping by a broad base, instead of attenuate.

SENECIO CRASSULUS is a name which I am obliged to give to a species of the Colorado Rocky Mountains (extending, however, to the northern part of Wyoming), the *S. integerrimus*, Gray in Am. Jour. Sci. xxxiii. 11, & Proc. Acad. Philad. 1863, 67, not of Nuttall, first collected by *Parry*. It is remarkable for its thickened involucre, becoming conical after anthesis, and multangular by the fleshy carination of its bracts; the character striking in the living plant.

SENECIO CLEVELANDI, Greene, is a well-marked Californian species, the characters of which are published in Bull. Torr. Club, while this paper is passing through the press.

SENECIO WERNERIÆFOLIUS is *S. aureus?* var. *werneriæfolius*, Gray, Proc. Acad. Philad. 1863, 68.

SENECIO PETRÆUS, Klatt, in Abh. Nat. Gesell. Halle, xv., is *S. aureus?* var. *alpinus*, Gray, Am. Jour. Sci. l. c., which must also be allowed to be a distinct species.

SENECIO CARDAMINE, Greene, Bull. Torr. Club, of the mountains of New Mexico, is a marked species, standing next to *S. renifolius*, Porter.

SENECIO AUREUS, L., has to be in part recast. *S. Elliottii*, Torr. & Gray, appears to come into the var. *obovatus*, and *S. subnudus*, DC. is only an attenuated and usually monocephalous variety of *S. aureus.*

SENECIO NEO-MEXICANUS is a name now given to a troublesome species, collected in New Mexico by *Wright*, *Thurber*, *Henry*, *Greene*, &c., in Arizona recently by *Lemmon* and *Pringle*, and within the borders of California by *Parish*, specimens of which have been variously and dubiously referred to *S. Fendleri*, *multilobatus*, *aureus*, &c.

SENECIO LOBATUS, Pers. A delicate and depauperate state of this common species, recently collected by Palmer in Southern Texas, is the same as Berlandier's 1741, on which Klatt, in Abhand. Nat. Gesell. Halle, xv., has founded his *S. imparipinnatus.*

SENECIO MADRENSIS. Herbaceus, floccoso-tomentosus; caule 2–3-pedali e rhizomate nodoso; foliis oblongo-lanceolatis penniveniis, argute denticulatis (vel inferne dentatis), supra laxe araneoso-lanatis subtus tomento densiore incanis, radicalibus in petiolum attenuatis, caulinis basi subcordata sessili apice sensim attenuato-acuminato; capitulis sat numerosis subpaniculatis (lin. 5–6 longis) multifloris; involucro bracteolis subulatis calyculato; ligulis aut 1–2 brevibus aut nullis; corollis disci pallide flavis breviter 5-dentatis; acheniis fere glaberrimis. — On the Sierra Madre south of Saltillo, Coahuila, Palmer, 756. Remotely allied to *S. multidentatus*, Schultz Bip.

SENECIO SALIGNUS, DC. l. c. Near Parras, and in the northern part of Nuevo Leon, 743, 744, the latter a slender form, same as Berlandier's 1367, on which is founded *S. axillaris*, Klatt, l. c.

ARNICA NEVADENSIS. Semipedalis, puberula, subcinerea; foliis integerrimis oblongis plerumque obtusis subchartaceis, caulinis (paribus 2–3) sessilibus, imis radicalibusque obovatis et subrotundis longiuscule petiolatis basi aut abrupta aut subito angustata; capitulis paucis longe pedunculatis iis *A. cordifoliæ* referentibus. — California, collected several years ago on Lassen's Peak, by *Mrs. Austin*, in a cinereous form: not a little resembling *Whitneya dealbata*, the rays almost an inch long. Now again collected in the northern Sierra Nevada, altitude 9,000 ft., by *Mr. Pringle*, in a greener form, with smaller rays, some of the radical leaves abrupt at base, but none subcordate; the largest barely two inches long.

ARNICA SACHALINENSIS. Fere glaberrima; caule robusto bipedali multifoliato; foliis oblongo-lanceolatis acutis acutissime serratis nervoso-venosis basibus angustioribus connato-vaginatis (summis exceptis);

pedunculis paucis brevibus pubescentibus; involucri (pollicem alti) bracteis lato-lanceolatis; corollæ tubo hirsuto; antheris nigricantibus. — *A. Chamissonis*, Schmidt, Fl. Sachal. 151, non Less. — Sachalin Island. — Associated with *A. Unalaschensis* and *A. obtusifolia* by the anthers; very different from *A. Chamissonis*.

Cynaroideæ.

CNICUS, L. In revising this genus for the Synoptical Flora of N. America, the species have been newly arranged, and several new names have been brought in, of which some mention will here be made. The section *Echinais* nearly breaks down. The only one of our species strictly belonging to it is

C. AMERICANUS, viz. *C. carlinoides*, var. *Americanus*, Gray, Proc. Am. Acad. x. 48, which appears to be essentially different from the Asiatic species.

C. HALLII is a new species of the group with narrow and loose involucral bracts, gradually tapering from a comparatively narrow base, the outer little shorter than the inner, — to which belong specimens variously referred to *C. Parryi*, *remotifolius*, *Hookerianus*, *eriocephalus*, and *edulis*. It is no. 310 of Hall's Oregon collection, and was also collected by Lemmon in S. W. California, and in S. Utah by Mrs. Thompson. Hall's specimen had been referred to *C. edulis*, but it has not the peculiar filiform corolla-lobes with capitellate-callous tips of that species.

C. KAMTSCHATICUS, Maxim., of the same section, is a new acquisition, from Atkha, one of the Aleutian Islands, collected by Lieut. Turner. It is the only indigenous species we have which is not peculiar to North America.

C. EATONI, to which is referred *Cirsium eriocephalum*, var. *leiocephalum*, with *C. foliosum* and *C. Drummondii* in part, of D. C. Eaton in Bot. King Exped., ranks between the preceding group and one to which belong *C. Andrewsii*, *Neo-Mexicanus*, *Californicus*, &c., with more imbrication to the involucre, the upper portion of the bracts more or less spreading and spinescent-tipped, and no trace of viscid or glandular line or ridge on the back.

C. ROTHROCKII, already published in the Proceedings, vol. xvii., follows *C. Arizonicus* in the next group, but is a very distinct species.

C. FOLIOSUS, Gray. To this (not to *C. Americanus*), according to the character, we would now refer *Cirsium scariosum*, Nutt.

C. WHEELERI is a new species, allied to the foregoing, but with the inner bracts of the involucre more conspicuously scarious-tipped, the lower successively shorter and more appressed, the corollas crimson-purple. It was collected near Camp Apache, in Arizona, by Rothrock in Wheeler's Survey, and was referred by him to *C. undulatus*. It is his no. 293.

In the section with closely appressed-imbricated involucral bracts, only the prickle, if any, spreading, the outer successively shorter, and most of them having a viscid-glandular ridge, line, or spot on the back of the tip, some changes have been made, especially in the difficult groups to which *C. undulatus* belongs.

C. GRAHAMI, *Cirsium Grahami*, Gray, Pl. Wright. ii. 102, Hook. Bot. Mag. t. 2885, is distinguished anew. The scabrous-ciliolate edges of the principal involucral bracts give a good diagnostic character, and its habit is well marked.

C. OCHROCENTRUS, *Cirsium ochrocentrum*, Gray, Pl. Fendl. 110, is again distinguished from *C. undulatus*, taking with it some specimens which had been referred to var. *megacephalus* of the latter. Its involucral bracts are comparatively larger, flatter, broader at base, and only now and then develop a narrow viscid line or ridge on the back of the tip of some of them, and the prickle is usually longer.

C. ALTISSIMUS, Willd. To this we have to append two varieties, —

Var. FILIPENDULUS, *Cirsium filipendulum*, Engelm., of Texas, which had been confounded with *C. Virginianus*, and

Var. DISCOLOR, *C. discolor*, Muhl., differing only in the cutting of the leaves from *C. altissimus*, to which it must be united, although intermediate specimens seem to be rare.

Mutisiaceæ.

GOCHNATIA HYPOLEUCA. *Moquinia hypoleuca*, DC. Prodr. vii. 23. This shrub, which occurs along the borders of Southwestern Texas, certainly has more or less polliniferous fertile flowers; and the same is true in some specimens of the typical species of the genus, *M. polymorpha*. The style-branches of the latter, if not so exactly truncate as is figured by Heyland in DC. Mem. Comp. t. 13, are so nearly so as to offer no obstacle to the reception of the following species into the genus: —

GOCHNATIA GLOMERIFLORA. Forte herbacea, tantum puberula; foliis ovalibus, chartaceo-coriaceis concoloribus acuminatis modo *Pereziæ* rigide dentatis et reticulatis (4-pollicaribus): capitulis arcte glomeratis; glomeribus in axillis foliorum sessilibus summisve secus apicem nudum rami concatenatis; involucro 4–5-floro, bracteis lanceolato-subulatis 3–5-seriatis; floribus pallidis; styli ramis apice truncatis. —

Cuernavaca, Mexico, coll. *Bilimek* (October, 1866), no. 512. Ex herb. Cosson.

PEREZIA, Lag. The section *Acourtia*, to which all the Mexican and North American species belong, is well marked by its homomorphous flowers, even the marginal corollas having the three-toothed outer lip little if at all longer than the two-parted inner lip. True *Perezia* consists of the South American species, with the inner lobes much shorter than the liguliform outer lip. *

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* PEREZIA, § ACOURTIA. *Key to the N. American and Mexican Species.*

§ 1. *Scaposæ.*

P. RUNCINATA, Lag. ex Don.

P. NUDICAULIS, Gray, Pl. Wright. i. 127.

§ 2. *Nanæ, ilicifoliæ, capitulis ad apicem caulium vel ramorum solitaris sessilibus.*

P. NANA, Gray, Pl. Fendl. i. 111.

P. PARRYI, Gray, Proc. Am. Acad. xv. 40.

§ 3. *Caulescentes, foliatæ, sat altæ,*

* Capitulum solitarium, pollicem altum et latum, crasso-pedunculatum in caule robusto: involucri subhemisphærici bracteæ exteriores ovatæ, coriaceæ, majusculæ, laxæ, interioribus latiores et paullo breviores.

P. WISLIZENI, Gray, Pl. Fendl. l. c., Pl. Wright. i. 126.

* * Capitula pauca vel sparsa, pollicaria vel ultrapollicaria: involucri turbinati bracteæ homomorphæ, angustæ, acutissimæ, exteriores gradatim breviores.

P. FORMOSA. *P. turbinata*, Gray, Pl. Wright. l. c., non Llav. & Lex. *Acourtia formosa*, Don, Trans. Linn. Soc. xvi. 204. *A. macrocephala* & *Trixis turbinata*, Schultz Bip. in Seem. Bot. Herald, 305, t. 55. — Northern Mexico, *Sesse & Moçino*, ex Don, *Seemann.*

P. TURBINATA, Llav. & Lex. Nov. Veg. Descr. 25. Caule inferne asperulo superne ramisque gracilibus laxe oligocephalis; foliis "coriaceo membranaceis" ovatis oblongisve amplexicaulibus creberrime spinuloso-denticulatis, majoribus 4–5-pollicaribus; ramealibus parvis, summis in bracteas lineari-subulatis transeuntibus; pedunculis gracilibus; capitulis pollicaribus; involucro 20–30-floro e bracteis circiter triseralibus lanceolatis sensim acuminatis sicco-chartaceis. — Described here from abundant specimens collected by *Schaffner* (no. 226), on a mountain-side, in the valley of Istlava, "Vallée de Mexico." Answers far better to the characters given by Llave & Lexarsa than does the preceding (to which before knowing the present species I had assigned the name), and the habitat accords better. For the *P. formosa*, as we must now name it, is known only from the northern part of Mexico.

* * * Capitula numerosa, ¾-pollicaria (8–12-flora), in thyrsum elongatum strictum foliosum aggregata: involucri bracteæ angustæ, acutissimæ.

P. THYRSOIDEA, Gray, Bot. Mex. Bound. 104. Viscidulo-puberula.

P. MOSCHATA, Llav. & Lex. l. c., if of the genus, may be placed here.

* * * * Capitula sat numerosa, vix ultra-semipollicaria, aut laxe aut glomeratim cymoso-paniculata.

Cichoriaceæ.

STEPHANOMERIA, Nutt. A revision of the genus for the Flora of North America results in some increase of the species, and a better

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+– Involucrum laxiusculum, pauciseriale, bracteis tenuibus angustis acutissimis vel acutatis sæpissime puberulo-granulosis,

++ Apice subito breviter mucronato-acutatis: capitula 10–15-flora, laxe cymoso-paniculata.

P. MICROCEPHALA, Gray, Pl. Wright. i. 127, & Bot. Calif. i. 422. *Acourtia microcephala*, DC. S. W. California.

++ ++ Sensim acutissimis: capitula laxe vel aperte cymoso- vel thyrsoideo-paniculata.

= Folia basi lata cordiformi vel auriculata pl. m. amplexicaulia, cum ramis minuta puberula vel granulosa, nunc viscidula.

P. THURBERI, Gray, Pl. Thurb. 324. Capitula 5–6-flora. S. Arizona, *Thurber, Lemmon.*

P. OXYLEPIS, Gray, Proc. Am. Acad. xv. 41. Capitula 12–16-flora. (*Acourtia,* Schultz Bip. in coll. Liebm.)

P. HEBECLADA, Gray, Pl. Wright. l. c. *Acourtia hebeclada,* DC. Prodr. vii. 66; Deless. Ic. Sel. iv. t. 95. Capitula 15–20-flora.

P. Humboldtii, Gray, l. c., must be a factitious species. One element, which gives the name, is *Dumerilia Humboldtii,* Less. in Linnæa, v. 13, described from an imperfect specimen of Humboldt's in the Willdenovian herbarium, the number of flowers in the head not mentioned, but the involucral bracts described as broad and rather obtuse or acute. In Syn. Comp. 408, Lessing refers to this *Proustia Mexicana,* Don. DeCandolle follows this, making the character simply "capitulis 5-floris." This is taken from Don, who describes an evidently different plant, with "involucri squamis ovato-lanceolatis acuminatis." Don's plant, from the collection of Moçino and Sesse (which was largely from the north), answers not badly to *P. Thurberi,* of which the outermost involucral bracts are "ovato-lanceolatis acuminatis." Lessing's plant, which would carry the name *Humboldtii,* may be *P. reticulata.*

= = Folia crassiora basi angustiora, haud amplexicaulia, cum ramis glaberrima, subglauca.

P. SEEMANNI, Gray, Pl. Wright. i. 127. Capitula laxe cymosa, 8–10-flora.

+– +– Involucrum laxiusculum, pauci–pluriseriale; bracteis tenui-chartaceis obtusis vel obtusiusculis (nunc mucronato-acutatis), dorso lævi glabro: folia submembranacea vel chartacea, nec coriacea,

++ Lanceolata, basi angusta nec auriculata, venis parum reticulatis.

P. COULTERI, Gray, Proc. Am. Acad. xv. 40, pro parte. Caule vel ramo gracili apice nudo aperte cymoso-polycephalo: foliis bipollicaribus lato-lanceolatis parum denticulatis (infimis haud visis); capitulis (parum semipollicaribus) 7–8-floris fere omnibus pedicellatis; involucro pauciseriali, bracteis lineari-lanceolatis (semilineam latis) obtusiusculis. — Mexico, near Zimapan, *Coulter,* no. 234. — I had confounded it with a Mexican form of the next.

understanding of the characters. The changes and additions are briefly exhibited in the following synopsis.

§ 1. ALLOSERIS (Gray, Proc. Am. Acad. vi., in part). Heads of the largest, about 12-flowered: involucre obviously imbricated: recep-

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++ ++ Folia oblonga seu ovata, reticulata, modo generis crebe denticulata vel dentata,

= Basi sessili haud angustata aut truncata aut subcordata sed parum amplexicauli: caulis erectus: rami ad apicem aperte cymoso-pleiocephali: involucrum pauciseriale, bracteis angusto-oblongis obtusis vel intimis obtusiusculis.

P. WRIGHTII, Gray, Pl. Wright. i. 127. *P. Arizonica*, Gray, Bot. Calif. i. 422, forma rigidior. *P. Coulteri*, pro parte, Gray, Proc. Am. Acad. xv. 40. Texas to Arizona, and a rather rigid and small-leaved form extending into Mexico to San Luis Potosi, *Schaffner*, *Parry & Palmer*, no. 547 in part.

= = Basi cordata vel sagittata amplexicauli: caulis gracilis, patenti-ramosus; ramis oligocephalis; involucrum circiter quadriseriale,

a. Campanulatum pluriflorum.

P. CARPHOLEPIS (*Acourtia carpholepis*, Schultz Bip. in coll. Liebm.). Ramis flexuosis patentissimis; foliis læte-viridibus ovatis oblongisve sæpe acuminatis quandoque sinuatis; capitulis in ramulos breves foliatos paucis brevissime petiolatis semipollicaribus circiter 10-floris; involucri bracteis obtusissimis ovalibus oblongisque apice nunc purpureo tinctis. — *P. patens* var. β & var. γ, Gray, Pl. Wright. l. c. Chiapas, &c., S. Mexico, *Linden*, 439, *Galeotti*, 2001, *Liebman*, 351 in part, *Ghiesbreght*, 525, the latter in pine forests.

P. PATENS, Gray. Glaucescens; ramis virgato-paniculatis; foliis oblongis obtusis mucronato-denticulatis; capitulis majoribus ⅔–¾-pollicaribus pedunculos graciles bracteolatos terminantibus circa 20-floris; involucri bracteis ovato- et lanceolato-oblongis obtusiusculis. — *Acourtia formosa*, Schultz Bip. in Bot. Herald, t. 56, & *Trixis patens*, l. c. p. 315. — N. W. Mexico, *Seemann*.

b. Involucrum cylindraceum 5-florum.

P. DUGESII. Foliis ramisque flexuosis *P. carpholepidis*; capitulis ultra-semipollicaribus in glomerulum axillare sæpius brevipedunculatum basi 1–2-phyllum congestis; involucri 5-flori bracteis latiuscule linearibus mucronato-apiculatis, extimis parvulis ovato-oblongis magis acuminatis; floribus purpureis. — Guanaxuato, *Dugès*. A flowering branch only.

+- +- +- Involucrum arctius imbricatum, bracteis firmioribus ovalibus oblongisve obtusis nunc mucronulatis: capitula magis fasciculato-congesta plerumque sessilia,

++ 8–15-flora: folia basi sat lata truncata, subcordata, vel auriculata.

P. ADNATA, Gray, Pl. Wright. i. 127. Subglanduloso- vel viscidulo-puberula; caule ramisque usque ad capitula pauciuscula glomerulato-congesta æqualiter foliosis: foliis chartaceis ovatis ovalibusque, basi lata auriculis sæpius adnatis; involucro cylindraceo 8–11-floro. — *Dumerilia Alamani*, DC. Prodr. vii. 67, therefore *Perezia Alamani*, Hemsl. Biol. Centr.-Am. Bot. ii. 255. — Ghiesbreght's plant (the first to be described under this genus) has all the cauline leaves with tacle alveolate, the alveoli fimbriolate-hirsute: pappus sordid, short-plumose: perennial.

S. CICHORIACEA, Gray, Proc. Am. Acad. l. c.

§ 2. STEPHANOMERIA proper. Heads 3–20-flowered: receptacle quite naked: pappus-bristles slender, or paleaceous-dilated only at base.

* Heads fully half an inch high, 10–20-flowered, somewhat corymbosely disposed,

+ Terminating leafy stems and branches: pappus sordid, of rather long-plumose bristles: involucre a little imbricated, i. e. having one or two bracts intermediate between the principal ones and those of the calyculus, 10–12-flowered.

S. PARRYI. Low, widely branched from the base; leaves run-

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auricles adnate-decurrent (a quarter of an inch), those of the short branches little or not at all so. Alaman's plant, described by DeCandolle (with "auriculis adnatis" in the generic character), is manifestly of the same species; and good specimens, evidently only elongated branches, have been received from Schultz (under the mss. name of *Trixis Pipitzahuac*), collected by Schaffner in the valley of Tolucca, near "Tinancinopo" and near "Venancingo" (the same doubtless cited by Hemsley, l. c. 256, under *P. fruticosa*, to which Schultz first referred it); the base of leaves little if at all adnate. My conjectural reference of this species to *P. fruticosa* Llav. & Lex., cannot be sustained, nor can DeCandolle's *Acourtia formosa* be the same.

P. PLATYPHYLLA, Gray, Pl. Fendl. 111, & Pl. Wright. l. c., is probably, but not certainly, a thinner-leaved and less rigid state of the following.

P. RIGIDA, Gray, l. c. Glaberrima, glaucescens, robusta; foliis crasso-coriaceis rigidis oblongis vel inferioribus obovato-oblongis, basi parum angusta subcordata sagittato-auriculata, summis parvulis nunc integerrimis; capitulis nudatim cymosis; involucro oblongo-campanulato 9–11- (–15-) floro. — *Acourtia rigida*, DC. Prodr. vii. 66. *A. formosa*, Hook. & Arn. Bot. Beech. 437, i. e. "*Trixis latifolia*," Hook. & Arn. l. c. 300, but char. of "spinescent scales of the involucre" does not accord: probably some admixture of specimens. *Acourtia formosa*, DC. l. c., non Don, is probably the same species. It occurs in various collections.

++ Capitula 5-flora, raro 6-flora, numerosa, in glomerulis paniculata: involucri cylindracei bracteæ obtusissimæ: corollæ pallidæ: folia coriacea, oblonga, basi angusta sæpius acuta.

P. RETICULATA, Gray, l. c. 128. *Proustia reticulata*, Lag. ex Don, l. c. 200; DC. l. c. 27. A well-marked species, in various Mexican collections; said to be shrubby, but none of my specimens show it, nor have they the base of the stem.

P. FRUTICOSA, Llav. & Lex. i. 26, remains wholly doubtful. It is described as an alpine shrub, of the height of a man, with amplexicaul and roundish leaves, cylindrical and many-flowered involucre, and rose-colored corollas, the outer radiant and the inner small: so that it is a very doubtful member of this genus.

cinate-pinnatifid; pappus-bristles rather stout, naked at base, these often connate in pairs or threes.

S. LACTUCINA, Gray, l. c. Pappus-bristles slender and plumose to base.

+- +- Naked-paniculate: pappus bright white, soft, very plumose to base: involucre merely calyculate.

S. THURBERI, Gray, Pl. Thurb. 325, & Bot. Mex. Bound. 105.

S. ELATA, Nutt. Pl. Gamb. 173, from Sta. Barbara, California, remains unrecognized. Said to have 10-flowered heads, which *S. virgata*, Benth. may sometimes have; but seems to be excluded from that by "involucre and branchlets sprinkled with resinous dots."

* * Heads smaller, a quarter to a third of an inch high, rarely larger but narrow, normally 5-flowered, by depauperation sometimes 3–4-flowered, or in stronger plants occasionally 6–8- (or 10-?) flowered. — *Jamesia*, Nees, not Torr. & Gray.

+- Perennials from tortuous roots or a lignescent base, with junciform branches: pappus-bristles slender to base.

S. RUNCINATA, Nutt. Distinguishable from the following by generally stouter habit, larger heads, which are scattered along the main branches, and dull white pappus, the plume not descending quite to the base.

S. MINOR, Nutt. More slender, and leaves often filiform; the heads terminating the branchlets; the pappus bright white and very plumose down to the base. This is the *Jamesia pauciflora*, Nees in Neuwied Trav., from the Upper Missouri.

S. MYRIOCLADA, Eaton, Bot. King Exped. 198, t. 20. A much tufted and very slender-stemmed species, with scattered small heads, akenes striate at maturity; the bristles of the bright white pappus naked at the base. It has recently been rediscovered in Nevada by Mr. Marcus E. Jones.

+- +- Annuals or biennials.

++ Pappus bright white and soft; the bristles slender and plumose to the base: stems, &c. not rarely puberulent or tomentulose.

S. WRIGHTII. Seemingly biennial: stem rather slender and tall, corymbosely paniculate above, bearing naked-pedunculate terminal heads, with involucre almost half an inch long: leaves all very narrow, cauline linear-filiform: akenes contracted under the summit, smooth, as long as the long-plumose pappus. — *S. runcinata*, var., Gray, Pl. Wright. ii. 103, no. 1301. — W. Texas, *Wright*.

S. VIRGATA, Benth. Bot. Sulph. 42. *S. paniculata*, chiefly, Eaton, Bot. King Exp. l. c.; Gray, Bot. Calif. 428. *S. elata*, Nutt. Pl. Gamb. 173? Quite distinct from the following species, with which I had confounded it. The heads sometimes bear 6 or 8 flowers, or even 10 as it would seem, but commonly only 5. The akenes of the two species are similarly subclavate-oblong and rugose-tuberculate between the narrow ribs.

++ ++ Pappus sordid or fuscous; its bristles rather short-plumose down nearly or quite to the more or less paleaceous-dilated or squamelliferous base: heads 3–5-flowered, narrow, in a narrow open panicle.

S. PANICULATA, Nutt.; Torr. & Gray, Fl. ii. 743. Of more northern range than the preceding. Pappus inclined to form phalanges.

++ ++ ++ Pappus white or whitish; its bristles plumose above but naked below the middle; base more or less dilated or paleaceous, or with lateral setulose teeth or squamellæ: heads paniculate, on squamulose peduncles: akenes tuberculate-rugose at maturity.

= Pappus-bristles 9 to 18, with dilated bases not rarely connate into 4 or 5 phalanges.

S. EXIGUA, Nutt. l. c. *Hemiptilium Bigelovii*, Gray, Bot. Mex. Bound. 105. These two names were founded on extreme forms; Nuttall's upon exceedingly attenuate branches of an apparently depauperate plant, with very narrow 3–5-flowered heads. The latter name, upon the ordinary form with more robust stem, often 2 feet high, in no sense *exiguous*, the heads bearing 5 or rarely 6 to 8 flowers in an involucre of 4 or 5 lines in length. It is a species of wide range, mainly Southern.

= = Pappus-bristles 5 or sometimes 7, distinct, slender, dilated only at the very base, plumose only above the middle.

S. PENTACHÆTA, Eaton, l. c. Known only in W. Nevada (*Watson*, *Shockley*) as a low plant, and upon the edge of the desert in S. E. California, where *Parish* found a large form, 2 or 3 feet high.

§ 3. HEMIPTILIUM, Gray, in part. Heads 5-flowered, small: pappus of 4 to 6 rigid paleæ rather than awns, ciliate-plumose only toward the summit.

S. SCHOTTII, Gray, Bot. Calif. i. 427. *Hemiptilium Schottii*, Gray, Bot. Mex. Bound. 105. Found only by *Schott*, many years ago, on the Gila River.

MICROSERIS, Don. There are a few changes and one or two additions to be made in this genus. In the section *Scorzonella* they relate wholly to the typical group, the forms of which, although they closely approach, may be distinguished as follows: —

MICROSERIS PROCERA is tall and robust, has the largest heads of all and the broadest leaves (excluding a large form of the next which has been confounded with it), the pappus-paleæ are found to be lanceolate (either narrowly or broadly), acute, and about one fourth the length of the awn. It is restricted to N. W. California and adjacent Oregon, is *Calais glauca* var. *procera* in Proc. Am. Acad. vii. 364, a specific name which is not kept up under *Microseris* because it is very doubtful if it can be *Hymenonema glaucum* of Hooker, and it is *M. laciniata* var. *procera*, Gray, Proc. Am. Acad. ix. 209.

MICROSERIS LACINIATA, Gray, l. c., chiefly of the lower Columbia River, has smaller heads, less robust habit, shorter akenes, and pappus-paleæ deltoid or triangular-ovate, not longer than the breadth of the akene at summit, and abruptly tipped by an awn of 7 to 9 times its length.

MICROSERIS LEPTOSEPALA (*Scorzonella leptosepala*, Nutt.), from the Columbia River above the Cascades, is slender, with smaller and fewer-flowered heads; the involucre (only half-inch high) of fewer bracts, almost in two series, the inner wholly lanceolate-attenuate; paleæ of the pappus (often only 8) about a fourth or fifth of the length of the rather slender akene, ovate-lanceolate or narrower, and tapering gradually from the base upward into the awn. *Hymenonema glaucum*, Hook., only slightly characterized from an incomplete specimen, is probably a narrow-leaved form of this or of the preceding.

MICROSERIS BOLANDERI. *Calais Bolanderi*, Gray, Proc. Am. Acad. vii. 365, of N. W. California, was wrongly referred to and confounded with the preceding species in Proc. Am. Acad. ix. 209, and Botany of California. It has rather larger heads, mainly narrow involucral bracts, or the broader outermost small, and pappus-paleæ little exceeding the breadth of the akene, broadly ovate, mostly obtuse or retuse, and abruptly tipped by the slender awn.

§ CALAIS includes in the *Calocalais* subdivision the very long-awned *M. macrochæta*, not yet sufficiently known; also the short-awned old species, *M. linearifolia* and *M. Lindleyi*, and a new species, *M. acuminata* of Greene, which is *Calais Douglasii*, Gray, Pacif. R. Rep. iv. 113, not of DC. The species with subclavate to turbinate akenes are *M. aphantocarpha*, with its var. *tenella*, and a var. *palealis*, which shows a tendency to pass into *M. Bigelovii*. The *Eucalais* division contains a remarkable new species, *M. attenuata*, Greene, from the vicinity of Berkeley and of Monte Diablo, having attenuate-fusiform akenes, the slightly narrowed upper half not occupied by the seed: the species with more or less turbinate akenes are *M. Bigelovii*, *M. Douglasii*, and *M. platycarpha;* the last, which was very rare, now abundantly collected on hills around San Diego and San Luis Rey by Parry and others.

§ NOTHOCALAIS. *M. troximoides*, Gray, a remarkable plant, intermediate between *Microseris* and true *Troximon*, appears to have a rather wide range, from Montana to N. W. California.

HIERACIUM. One or two species of the section *Pilosella*, as limited by Fries in his Epicrisis, are sparingly naturalized or adventive in this country.

Of *Archieracium*, Fries, a form of *H. murorum* is also naturalized, and *H. vulgatum*, Fries, apparently occurs in Labrador. We have two leafy-stemmed species of this section, viz.: 1. *H. umbellatum*, L., an old-world species of only a northern range in this country, to which *H. macranthum*, Nutt., and *H. rigidum*, Fries, may be referred; 2. *H. Canadense*, Michx., which may be taken to include *H. corymbosum*, Fries, as to the Newfoundland plant, *H. auratum*, Fries, and, if the species is also N. European, *H. crocatum*, Fries. Even the distinctions between these two species are indefinite.

The section *Stenotheca*, as defined by Fries, contains all our other species; but in some of the Western ones the character as to the involucre does not so well hold.

1. *Atlantic Species*, all yellow-flowered and with sordid pappus. Those with columnar akenes, not tapering at summit, and loosely corymbose-cymose heads, are *H. paniculatum*, L., *H. venosum*, L. (partly), *H. scabrum*, Michx., and a species or set of forms which almost fill the seemingly most wide interval between the last two, and which, without much doubt, is *H. Carolinianum* of Fries, founded on specimens collected by Beyrich in pine barrens of Carolina; while the larger forms, having tomentose pubescence on the peduncles and involucre, may be suspected to be *H. Marianum*, Willd., a much older name. Indeed, the species is well represented by the *H. Marianum, Pulmonariæ Gallicæ subrotundis foliis*, &c., of Pluk. Mant. 102, t. 420, f. 5, whence the specific name. *H. Rugelii*, Arvet-Touvet, recently published, should be a form of the same. Fries assigns to *H. Carolinianum* "achenia longa, gracilia, sursum manifeste attenuata." So they are in our plant when half grown and not filled out, but at maturity there is no perceptible narrowing at summit.

The species of the Atlantic States having akenes fusiform-attenuate at summit, and also marked by thyrsoid-paniculate inflorescence, through most of which the main stem is continued, are only two, viz.: 1. *H. Gronovii*, L., as to the plant of Clayton and Gronovius, Flora Virginica, whence the name. The synonymy of this was mainly worked out in Torrey & Gray's Flora: but the synonym of Plukenet above referred to is to be excluded, and probably all that relates to *H. Marianum*, Willd. But it evidently is the *H. Marianum* of Fries with "anthela thyrsoidea," &c., although the phrase "achenia sursum leviter attenuata" does not so well apply to akenes the upward attenuation of which is conspicuous. 2. *H. longipilum*, Torr., the earliest name, first published without a character, and not to be superseded by *H. barbatum*, Nutt., as Tausch preoccupied that name. Var. *spathulatum* of this species, as we hesitatingly regard it, is a naked-stemmed form, which was collected by Professors Porter and Traill Green, on Tuscarora Mountain, in the Alleghanies of Pennsylvania, and provisionally named *Pilosella spathulata* by Schultz in Flora, 1862. The specimens are too young for satisfactory determination.

2. *Rocky-Mountain and Pacific Species.* — These, now considerably increased in number, may be exhibited synoptically, as follows: —

* Crinitely barbate or shaggy up to the heads, or even on the involucre, with long and whitish hairs: akenes columnar, not at all narrowed at summit: leaves entire.

H. SCOULERI, Hook. — Montana and Mountains of Utah to Brit. Columbia and Oregon. The Pennsylvanian plant taken for it by Hooker, in Flora Bor.-Am., must have been the hirsute form of *H. Gronovii*. See, in respect to this species, *H. cynoglossoides*.

H. HORRIDUM, Fries, Epicr. 154. *H. Breweri*, Gray, Proc. Am. Acad. vi. 553, &c. *H. relicinum*, Fries, l. c., from Bridges's collection, is probably the same species. — Sierra Nevada, California. The name given by Fries is the earlier, but is not very appropriate.

* * Crinitely very long-villous with black or dusky glandless wool on the head and peduncles, more or less naked below: heads solitary or few.

H. TRISTE, Cham. in herb. Willd., &c. — Aleutian Islands.

* * * Dark-hirsute and somewhat glandular about the heads, also some whitish stellular tomentum on involucre and peduncles: leaves and lower part of the stem *glabrous* or at most puberulent: alpine.

H. GRACILE, Hook. *H. arcticum*, Frœl. in DC., by the character is clearly of this species. *H. triste*, in part, Torr. & Gray, Fl. ii. 478.

H. triste, var. *gracile*, Gray, Bot. Calif. i. 481, with var. *detonsum*. In this variety the long and blackish hairs of the involucre are mostly or wholly wanting, and the grayish pubescence prevails. — Alaska and Brit. Columbia to the Sierra Nevada and higher Rocky Mountains down to Colorado.

* * * * Not crinitely hirsute or barbate about the heads, but mostly (as in many species) bearing long-setose hairs at base of stem and on lower leaves.

+– Flowers white: stem leafy and loosely branching, except in subalpine or depauperate specimens: leaves little if at all dentate: akenes linear-columnar: pappus sordid.

H. ALBIFLORUM, Hook. — Rocky Mountains to Brit. Columbia and California. To this without much doubt is to be referred *H. Vancouverianum*, Arvet-Touvet, Spicil. 10. At least all our specimens of Lyall's collection, distributed from Kew as "*H. Scouleri*," are of this species, and are white-flowered. A yellow color to the flowers was probably merely inferred by Arvet-Touvet from the name under which he found the plant in Boissier's herbarium. It would appear that at least three species must occur under the name of *H. Scouleri* in the Kew herbarium.

+– +– Flowers yellow, 15 to 30 in the oblong-campanulate heads: stems leafy, at least below, except in one species, glabrous or merely puberulent above: akenes columnar, not at all tapering upward: pappus from sordid to dull white.

++ Leaves or many of them salient-dentate: pappus whitish.

H. ARGUTUM, Nutt. Cauline leaves above rapidly diminished in size, even into linear entire bracts: heads on elongated peduncles in a lax diffuse panicle: involucre more or less dark glandular. — Coast Mountains of California, behind Santa Barbara, &c. *Hænke*, *Nuttall*, *Rothrock*, *Parry*.

H. PARISHII. More equally leafy up to the narrowly oblong panicle; no glandular hairs or stipitate glands: heads short-peduncled: involucre pale, granulose-puberulent. — Rock-crevices, San Bernardino Mountains, S. E. California, *Parish Brothers*.

++ ++ Leaves all entire, or repand and denticulate.

H. RUSBYI, Greene, Bull. Torr. Club, ix. 64. Mostly tall, leafy, bearing numerous heads in a compound panicle: leaves all elongated-oblong; cauline usually half-clasping: involucre 3 lines high, pale, barely puberulent: pappus sordid. — Mogollon Mountains, New Mexico, *Rusby*.

Var. Wrightii. More robust, hispidulous, even up to the peduncles, sometimes a few small bristles near the tips of the involucral bracts: pappus dull white. — *Crepis ambigua*, Gray, Pl. Wright, i. 129, not Pl. Fendl. — Western border of Texas, between the Limpio and Rio Grande, *Wright.*

H. cynoglossoides, Arvet-Touvet. A foot or less high (either from a naked base, or more commonly from a tuft of radical leaves), simple, 2–several-leaved, setose-hirsute or hispid at base, either hispidulous or glabrous above: leaves lanceolate to spatulate-oblong, at least the lower conspicuously setose-hirsute, upper sometimes glabrous: heads few or several and corymbosely disposed: involucre 4 or 5 lines high, glandular, sometimes glandular-hispidulous: pappus whitish. — N. W. Wyoming and Montana to Washington Terr., Oregon, and N. California. — Arvet-Touvet's species (Spicil. 20) is wholly founded on Parry's no. 188 of Wyoming collection, quite immature specimens of a form so nearly on the line between this species, as here recognized, and *H. Scouleri*, as to throw doubt upon the distinctness. A better representative of the species is found in the *H. Scouleri*, Torr. & Gray, Fl. ii. 478, chiefly, described from a specimen given by Sir William Hooker to Dr. Torrey, ticketed by the former "Hieracium Scouleri, coll. Scouler." This misled the authors of the Flora of North America into a character of that species which is not congruous with the original one.

Var. nudicaule. Leaves all in the radical tuft, or only one or two small ones on the slender (8 to 12 inch high) and glabrous scape. — Northern portion of the Sierra Nevada, California, *Lemmon, Mrs. Austin.*

+ + + Flowers apparently yellow, only 5 to 15 in the narrow and diffusely paniculate heads: involucre cylindraceous, of 7 to 9 broadly linear and obtuse principal bracts and 2 or 3 short ones, not at all glandular: akenes comparatively large, fully two lines long, chestnut-brown, slightly or at maturity not perceptibly tapering to the summit: pappus dark-fuscous: leaves obovate-spatulate, all in a radical tuft at the base of the loosely branching rather low scapes.

H. Bolanderi, Gray, Proc. Am. Acad. vii. 365. Leaves sparsely or densely long-hirsute: no other pubescence: scape and involucre smooth and glabrous. — Mountains in Humboldt Co., N. California, *Bolander.* Head-waters of the Sacramento, *Pringle.* Sierra Co., *Lemmon.* Only in Bolander's specimens do the (immature) akenes have a tapering summit.

H. GREENEI. Leaves villous-hirsute, also on both sides canescent-tomentose with stellular pubescence: scape, peduncles, and involucre cinereous-tomentose. — Pine woods, Scott Mountains, N. California, *Greene*.

+- +- +- +- Flowers yellow, 20 or 30 in the oblong heads: akenes fusiform, tapering gradually to a narrow summit, fully as long as the white or whitish and softer pappus: stems scapiform, bearing one or two small leaves toward the base, above only subulate bracts subtending peduncles or simple branches of the panicle: leaves of radical tuft obovate to spatulate, obtuse, entire or minutely denticulate, contracted into short wing-margined petioles. — § *Chionoracium*, Schultz Bip. *Crepidispermum*, Fries, Symb. *Heteropleura*, Schultz Bip. in Flora, 1861. Transition to *Crepis*.

H. PRINGLEI. Strictly scapose, wholly destitute of setose hairs and of glands: leaves all radical and rosulate, obovate, densely villous-lanate both sides: scape very slender, a foot or two high, minutely soft-pubescent, as also the involucre of the few heads: immature pappus bright white. — S. Arizona, on the Santa Rita Mountains, *Pringle*, *Lemmon*.

H. FENDLERI, Schultz Bip. in Bonplandia, ix. 173. *Crepis ambigua*, Gray, Pl. Fendl. 114. New Mexico, *Fendler*, *Wright*, *G. R. Vasey*. Colorado, *Parry*, *Hall & Harbour*. Somewhat polymorphous, with either reddish or blackish akenes, and the copious soft pappus sordid-whitish. The first of the subjoined forms is clearly of this species; probably the other also.

Var. DISCOLOR. Radical leaves (sometimes large) usually roundish, tinged with crimson-purple beneath: pappus nearly pure white. — Mountains of S. Arizona, *Lemmon*, *Pringle*, the latter distributed as "*Hieracium erythrospermum*, Greene, ined.," which, with name changed in publication, is really the following: —

Var.? MOGOLLENSE. Leaves narrower, not purple-tinged: bristly hairs disposed to be shorter: peduncles minutely and sparsely glandular-setulose: involucre smaller (only 5 lines high): immature akenes reddish: pappus pure white. — *H. brevipilum*, Greene in Bull. Torr. Club, ix. 64. — Mogollon Mountains, New Mexico, *Rusby*.

+- +- +- +- +- Flowers white or flesh color: akenes slender-columnar, hardly if at all narrowed upward, about the length of the bright white soft pappus: stem leafy.

H. CARNEUM, Greene. Glaucescent, above wholly glabrous and smooth, base of stem, radical leaves, and sparingly some of the cauline, beset with villous-setiform hairs: leaves entire, the upper narrowly lanceolate to linear: heads scattered in a corymbiform or irregular panicle: involucre campanulate, 4 or 5 lines high, pale, 15–20-flowered, of narrow lanceolate bracts: corollas light rose-color. — Mountains of New Mexico, *Greene*. Also collected long ago by Bigelow or Wright, too young. Huachuca Mountains, S. Arizona, *Lemmon*.

H. LEMMONI, Gray. Villose- or hirsute-setose up to the racemiform close thyrsus: stem simple, 2 feet high or more, very leafy: leaves lanceolate-oblong, denticulate with callous or glandular teeth; cauline partly clasping, acute; lowest oblong-spatulate, 4 to 7 inches long, tapering into winged petioles: heads (4 lines high) numerous in the oblong thyrsus, 12–20-flowered: involucre glabrous or nearly so, not glandular, not longer than the canescent-puberulent peduncles; its principal bracts narrowly linear, greenish-livid, obtuse: corollas short, seemingly white: akenes hardly 2 lines long, slender, obscurely if at all narrowed upward when mature, but manifestly so when younger: pappus not very copious, bright white. — Cave Cañon, near Fort Huachuca, S. Arizona, *Lemmon*. A species of Mexican type, belonging to the *Thyrsoidea* of Fries.

The following are Mexican species: —

H. ABSCISSUM, Less., — a Mexican species which we with probability identify, and conjecture to include *H. thyrsoideum*, Fries, a species of the same group with *H. Lemmoni*, — is said by Fries (Epicrisis, 150) to come from "Texas, ad Malpays de la Joyas," wherever that may be, and from "Alabama, *Hooker*." About which there may be some mistake; for nothing from Alabama under this name is found in the Hookerian herbarium.

H. MEXICANUM, Less. in Linnæa, v. 133, probably includes all the *Intybiformia* of Fries, Epicrisis, except *H. abscissum*. It is in Schaffner, Gregg, Galeotti, and Ghiesbreght's collections. Palmer's 757 (which probably had a white pappus, somewhat discolored in drying), and Parry & Palmer's 552, 553, and even 551 (which is probably *H. niveopappum*, Fries), belong to it; and 384 of Bourgeau is very nearly the form named by Schultz *H. præmorsiforme*.

H. CREPIDISPERMUM, Fries, Symb. 146, probably includes Palmer's 758, from the Sierra Madre, south of Saltillo; the flowers of which are said to be white. The pappus is white, and the akenes taper from near the base to the summit, but not very much.

TROXIMON ALPESTRE. *Eutroximon*, nanum, glabrum; caudice elongato; foliis spathulatis seu lanceolatis pinnato-incisis partitisve; scapo 2–3-pollicari debili; involucri bracteis fere *T. cuspidati* sed pau-

cioribus; acheniis apice parum contractis; pappo sat molli uniformi. — Washington Territory, on Mount Paddo (formerly called Mount Adams), *Suksdorf.* Oregon on Mount Hood or in the mountains near it, *L. F. Henderson.*

TROXIMON GRACILENS. *Macrorhynchus*, inter perennes, *T. aurantiaco* proximum; floribus etiam aurantiacis; foliis sæpissime integerrimis flaccidis; scapo ultrapedali; pappo nulli; rostro tenuissimo (lin. 4–5-longo) achenio fusiformi-lineari paullo longiore. — Cascade Mountains of Oregon and Washington Terr., *Lyall, Nevius, Suksdorf.* Rocky Mountains in N. Wyoming, *Dr. Forwood.*

Var.? GREENEI. Humilius; foliis linearibus lineari-lobatis. — Scott Mountains in Siskiyou Co., N. California, in dry open ground at 7,000 feet, *Greene.*

The beak of the akene affords very good characters in this difficult genus. I adopt the subjoined arrangement for the North American species. *

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* TROXIMON, Nutt.; Benth. & Hook.

§ 1. EUTROXIMON. Beak of the more or less linear akene either none or short and thickish, and traversed by the nerves of the body.

* No beak, the short contracted summit of the akene similar in texture to the body: involucral bracts tapering above into a slender acumination: pappus rigidulous.

T. CUSPIDATUM, Pursh, the earliest name published with a character. *T. marginatum*, Nutt.; not a bad name, for the tomentum commonly persists on the margins of the leaf.

T. ALPESTRE, Gray. Vide supra.

* * A firm and thickish lightly nerved beak, decidedly shorter than the body of the akene: involucral bracts not attenuate-acuminate.

T. GLAUCUM, Nutt., Pursh. A widespread and polymorphous species; of which the following are leading varieties: — Var. PARVIFLORUM, *T. parviflorum*, Nutt. Var. LACINIATUM, with forms on the one hand differing from *T. parviflorum* only in the laciniate-pinnatifid leaves, but in the Sierra Nevada with stouter and cinereous-pubescent forms, some approaching the next. Var. DASYCEPHALUM, to the synonyms of which in Flora N. America should probably be added *T. pumilum*, Nutt., as well as *T. taraxicifolium.* At least there are dwarf as well as large and robust forms.

§ 2. MACRORHYNCHUS. Akenes with a slender and nerveless (commonly filiform) beak.

* Perennials; the akene with acute or pointed beak-bearing apex.

+ Beak little or no longer than the cylindraceous or narrowly fusiform akene.

++ Flowers orange or reddish.

T. AURANTIACUM, Hook. *T. roseum*, Nutt., imperfectly known, seems to be

LACTUCA. Of genuine *Lactuca*, or the *Scariola* section, we appear to have five indigenous species, namely: L. CANADENSIS, L., the oldest

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only a depauperate variety of this. — Var. PURPUREUM, *Macrorhynchus purpureus*, Gray, Pl. Fendl. 114, appears to be only another form of this species.

T. GRACILENS, Gray, and var.? GREENEI. Vide supra.

++ ++ Flowers yellow.

T. NUTTALLII, Gray, Proc. Am. Acad. ix. 216, & Bot. Calif. i. 438, excl. pl. *Nevius*. To this I should refer the ambiguous forms from the Sierra Nevada, which were placed in *T. aurantiacum*, but which are near to *T. glaucum*.

T. APARGIOIDES, Less. in Linnæa, vi. 594. A small species, restricted to the coast of California. The following species has been confounded with it, the confusion beginning with Hooker and Arnott, in Bot. Beechey.

+- +- Beak slender-filiform, twice to four times the length of the short-fusiform or oblong (about 2 lines long) akene: pappus soft and fine, rather flaccid: flowers all yellow. — *Stylopappus*, Nutt.

++ Pappus (whitish) about the length of the beak, and only about double the length of the akene: head from half an inch to barely an inch high: ligules elongated: involucre villous-pubescent.

T. HUMILE. *Borkhausia Lessingii*, & *Macrorhynchus Lessingii*, Hook. & Arn. Bot. Beech. 145, & 361, excl. syn.; for it is not Lessing's *T. apargioides* by the character. *Macrorhynchus humile*, Benth. Pl. Hartw. 320, a small form. *M. Harfordii*, Kellogg, Proc. Calif. Acad., a larger form. Common near the coast, from Monterey, California, to Oregon.

++ ++ Pappus (bright white) much shorter than the more elongated and capillary beak: ligules short.

T. LACINIATUM. Glabrous or with some soft loose pubescence: closed head of fruit not over an inch high: akene 2 and beak 5 to 7 lines long. — *Stylopappus laciniatus*, Nutt. (specimens too young and small), & var. *longifolius*, Nutt. l. c. *Troximon grandiflorum*, var. *tenuifolium* & var. *laciniatum*, Gray, Bot. Calif. l. c. — Common from Oregon to Brit. Columbia, and a form of it in California, which too nearly approaches the next.

T. GRANDIFLORUM, Gray, l. c., with syn.; excl. vars. Leaves hirsutely or cinereous-pubescent, or glabrate: scapes stout: involucral bracts more imbricated, lanate or tomentose when young: fruiting head commonly an inch and a half high: akenes 2 and beak 6 to 8 lines long.

* * Perennials: akenes abruptly very long-beaked from a truncate summit.

T. RETRORSUM, Gray, l. c., with syn.

* * * Annuals, small, occasionally subcaulescent: beak of akenes filiform and long. — *Macrorhynchus*, Less. Syn. 139, but akene not at all "plano-obcompressum." *Kymapleura* & *Cryptopleura*, Nutt., l. c.

T. HETEROPHYLLUM. *T. Chilense*, Gray, Bot. Calif. l. c. *Macrorhynchus Chilensis*, Hook. Lond. Jour. Bot. vi. 256, but not of Less. *M. heterophyllus* & *M. Californicus*, Torr. & Gray. Varies much in the akenes, &c.; pretty clearly distinguished from the Chilian plant or plants, by the erect involucre not villous, and shorter outer bracts. Outer akenes sometimes pubescent or villous, not name of the *L. elongata*, Muhl. &c.; L. INTEGRIFOLIA, Bigelow (a better and perhaps nearly as old a name as *L. sagittifolia*, Ell., which is not quite certain); L. HIRSUTA, Muhl. and Nutt. (an older and quite as good a name as *L. sanguinea*, Bigelow); L. GRAMINIFOLIA, a southern species of wide extension westward; L. LUDOVICIANA, DC., a species which ranges from Dakota to Texas, and is marked by its larger heads and more imbricated and large-bracted involucre. A section, LACTUCASTRUM, is proposed for L. PULCHELLA, DC., with characters intermediate between the preceding and the following.

It is impossible not to agree with Bentham and Hooker in referring the American *Mulgedia* to *Lactuca*. Of our three species, L. FLORIDANA has an obvious but stout beak to the akene. But the akenes figured by Gærtner for this species, when he transferred *Sonchus Floridanus*, L. to *Lactuca*, do not belong to it. There is good reason to believe that these figures were made from the specimen of *Sonchus Floridanus* in the Banksian herbarium; and that, as we had long ago noted, is *L. leucophæa.*

L. ACUMINATA, *Sonchus acuminatus*, Willd. The akenes of this are beakless, and with barely an obscure neck. *L. villosa*, Jacq. Hort. Schœnbr., is an earlier but a misleading name. The plant has no villosity and commonly is devoid even of hirsute pubescence on the midrib and veins of the leaf beneath.

L. LEUCOPHÆA, *Sonchus leucophæus*, Willd., is the well-known and widely diffused species with sordid pappus. Its akenes are narrowed at summit into a neck, but have no beak. The large synonymy of this species may be still further extended; for it must be the *S. racemosus* as well as *S. spicatus* of Lamarck, *S. biennis* of Mœnch, and it may also be *S. multiflorus*, Desf.

IXERIS, Cass., which, with CHORISMA, Don, we had maintained as a genus under the former name, are referred as sections to *Lactuca* by Bentham and Hooker. But the akenes are equally and saliently costate all round, and are essentially terete. We suppose that the genus ought to stand.

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rarely utricular and enlarged, when it is *Cryptopleura Californica*, Nutt. l. c; sometimes with ribs extended into wings, and these sinuous-undulate and thickly covering the body, when it is *Macrorhynchus heterophyllus*, Nutt. l. c., in Errata made *Kymapleura heterophylla*; — two peculiar genera upon mere conditions of one species. A difference between marginal and inner akenes is not rare in *Cichoriaceæ.*

II. *Miscellaneous Genera and Species.*

Malvaceæ.

CALLIRRHOE LINEARILOBA. Facies inter *C. involucratam* et *C. digitatam*, parum hirsuta, nunc glabella; caulibus adscendentibus; foliis 1–2-pedatipartitis, segmentis lobisve linearibus vel lanceolatis; pedunculis elongatis; involucri phyllis iis *C. involucratæ* similibus sed minoribus erectis; corolla *C. involucratæ* nisi colore pallide lilacino; carpellis glabriusculis, rostro brevi e margine denticulato dorsali (modo *C. Papaveris*) libero. — *Malva involucrata*, var. *lineariloba*, Torr. & Gray, Fl. i. 226, probably, though I have not the specimens of Drummond. It is evidently Berlandier's no. 1815. It comes not rarely from Texas, is no. 85 and 86 of Palmer's Texano-Mexican collection from Lerios in Coahuila, and is now, June and July (1883) flowering and fruiting in the Botanic Garden of Harvard University. It might be supposed to be *C. palmata* of Buckley, in Proc. Acad. Philad. 1861, 449, the description of which omits all mention of an involucre, but that is said to be a prostrate plant, and the imperfect original specimen in our herbarium seems to belong to a depauperate *C. involucrata.*

Leguminosæ.

COLOGANIA LEMMONI. *C. humifusæ* similis; pube magis villosa; foliolis obovatis 2–3-plo majoribus; floribus ut videtur omnibus brevipedunculatis vel sessilibus; legumine lineari-oblongo utrinque obtusissimo polyspermo, stipiti nullo vel obscuro. — Arizona, on the high mesas of the Chiricahui Mountains, 1881, and the Huachuca, 1882, *Lemmon.* The specimens of both seasons are in fruit only, or with remains of cleistogamous flowers.

CRACCA SERICEA = *C. Edwardsii*, var. *sericea*, Gray, Proc. Am. Acad. xvii. 201, now repeatedly collected, in flower and fruit, appears to hold its characters, so that we have to admit it as a species.

ASTRAGALUS REVERCHONI, Gray in coll. N. American Plants, distributed by A. H. Curtiss, no. 601 A, supplied by *J. Reverchon*, from the central parts of Texas. It was earlier collected by Wright, and by Buckley, but in insufficient specimens. Since its distribution by Curtiss under this name, it has been identified as the *Phaca cretacea* of Buckley, Proc. Acad. Philad. 1861, 452, which was first referred to *A. lotiflorus* and afterwards less incorrectly to *A. Missouriensis*, and it lies in a certain sense between the two. There is an Asiatic *Astragalus cretaceus*, so that this species may well bear the name of

our most excellent correspondent and acute botanist, *J. Reverchon*, of Dallas, Texas.

ASTRAGALUS RATTANI. E radice *annua* mox multicaulis, erectus, pedalis, striguloso-puberulus; foliolis 5–7-jugis obovato-oblongis emarginatis; floribus (9–15) in pedunculo folium superante capitatis; calycis dentibus tubo campanulato paullo brevioribus corolla violacea (lin. 5 longa) dimidio brevioribus; leguminibus etiam capitato-congestis erectis fere filiformibus (bipollicaribus lineam diametro) teretibus sutura dorsali intrusa bilocellatis. — Mendocino Co., California, on prairies north of Mad River, and on Rattlesnake Creek, June, 1882, *V. Rattan.* A remarkable species of the group formerly represented only by *A. Breweri* and *A. tener*, well characterized by its long and narrow straight legumes in a capitate cluster, from three to seven maturing.

ASTRAGALUS DREPANOLOBUS. *Micranthi*, subpedalis, ramosus, striguloso-puberulus; foliolis 4–5-jugis obovatis sæpius emarginatis; pedunculis cum racemo pauci–plurifloro laxo folium superantibus; floribus albo-violaceis; calycis lobis subulatis tubo brevi-campanulato æquilongis; corollæ (lin. 4 longæ vexillo emarginato; legumine oblongo-lineari compresso obtuso falciformi estipitato fere glabro sutura dorsali introflexa bilocellato. — Washington Territory, on John Day's River at Scott's Bridge, *J.* & *T. J. Howell*, May, 1882. A species with much the habit of *A. multiflorus*, but with a very different falcate and completely bilocellate legume, of an inch in length, 2 lines in width; the transverse section Y-form.

ASTRAGALUS SPEIROCARPUS, Gray, Proc. Am. Acad. vi. 225, has now been received from Mr. Howell, collected on the Columbia River, fine fruiting specimens exactly like the original of Lyall, also in flower. It is different from the plant of Western Nevada and California, so named in the Botany of California, &c., which, indeed, appears to be only a variety of *A. cyrtoides.*

ASTRAGALUS PARISHII. *A. oocarpo* similis, pariter flaviflorus; caule laxo bipedali; foliolis junioribus sericeo-pubescentibus; racemo minus laxo; calycis dentibus subulatis tubo dimidio brevioribus. — Common in San Bernardino Co., *S. B.* & *W. F. Parish.* Apparently also collected in adjacent parts of Arizona by *Palmer.* Flowers earlier than *A. oocarpus*, of San Diego Co., which is erect, stout, and fully four feet high. The legumes seem to be similar.

ASTRAGALUS BICRISTATUS. *Podosclerocarpi*, subcinereo-puberulus; caule sat valido; foliolis 7–11-jugis sublinearibus (lin. 6–10 longis); pedunculis folium superantibus; spica aut brevi densa aut demum elongata laxa; floribus adscendentibus (lin. 6–9 longis); calyce pilis adpressis nigris albidisque puberulo, dentibus subulatis tubo oblongo-campanulato dimidio brevioribus; corolla ut videtur alba, vexillo oblongo-ovato acutiusculo; ovario glabro; leguminibus pendulis stipitatis (stipite e calyce breviter exserto), maturis crasso-coriaceis hamato-incurvatis utrinque acutatis turgido-obcompressis suturis utrisque salientibus acute carinatis prorsus unilocularibus. — San Bernardino Mountains, S. E. California, in a cañon on the Mohave side, May, 1882, in flower, and in Holcomb Valley, August, in flower and fruit, *S. B. & W. F. Parish.*

MIMOSA LEMMONI. *Habbasia*, inter *Rubricaules* et *Acanthocarpas*, fruticosa, late ramosa, molliter pubescens; aculeis ramealibus et petiolaribus sparsis brevibus recurvis, infrastipularibus validioribus rectis geminis; stipulis spathulatis vel linearibus caducis; pinnis 4–7-jugis; foliolis 9–11-jugis (lin. 1½–2 longis) elliptico-oblongis demum glabellis subtus uninerviis et penniveniis; capitulis globosis longius pedunculatis axillaribus et ultra folia racemosis paniculam nudam efficientibus; floribus albis nunc purpureo tinctis glabris; corolla infundibuliformi breviter 5-lobo calyce triplo longiore; leguminibus angusto-oblongis rectis utrinque obtusatis (pollicem longis lin. 4 latis) furfuraceo-pubescentibus margine aculeis brevibus rectiusculis armatis. — S. Arizona, *Lemmon*, in a cañon near Fort Huachuca, in flower, with mainly racemose-paniculate heads; and Cave Cañon, in fruit, with only axillary peduncles. Near to *M. Grahami*, Gray, Pl. Wright. ii. 52, to which it might be referred except for the constant cinereous pubescence.

Caprifoliaceæ.

SAMBUCUS MELANOCARPA. Facie fere *S. Canadensis;* cymis thyrsoideo-paniculatis modo *S. racemosæ* sed tantum convexis; drupis nigris nec glaucis. — A Rocky-Mountain species which has given some trouble; first collected in New Mexico by Fendler; in the Wahsatch and (recently with fruit) in the mountains of Montana by Watson; by Brewer and Bolander in the Sierra Nevada, California; and in the Cascades of Oregon by Cusick.

LONICERA SULLIVANTII. Glaucissima, sarmentosa, parum volubilis; foliis ovalibus seu obovato-oblongis crassiusculis, iis ramorum floridorum plerisque connatis; corolla lutescente extus glabra, tubo pl. m. gibbo (intus fauceque hirsutula) semipollicari limbo vix longiore; filamentis fere glabris. — *L. n. sp.* Sullivant, Cat. Pl. Columbus, 57. *L. flava*, var. Torr. & Gray, Fl. ii. 6; Gray, Man., &c. — Central Ohio

to Illinois, Wisconsin, and Winnipeg; also in Tennessee near Nashville, and perhaps in the mountains of North Carolina; but specimen in fruit only. Introduced into cultivation many years ago at the Botanic Garden, Cambridge, from plants sent by Mr. Sullivant, thence widely distributed. In Flora of North America, &c., taken to be a variety of *Lonicera flava*, Sims. But that is a species of the Southern States only, still preserved in cultivation, with fragrant flowers; bright orange-yellow corolla, the tube slender, longer than the limb, not at all gibbous. Elliott gives a good account of it, and of its mention by Drayton, "View of S. Carolina, published in 1802, p. 64," as growing on Paris Mountain, Greenville, where it was afterward collected by Fraser and brought into cultivation. The "exposed rocky summit of Paris Mountain" is in Laurens Co., S. Carolina, where the plant should be sought anew. *L. Sullivantii* ranks between *L. flava* and *L. glauca*, Hill (*L. parviflora*, Lam.); and from the latter species the var. *Douglasii*, Torr. & Gray, may be erased. For Lindley's *Caprifolium Douglasii* is plainly *L. hirsuta*, Eaton; and many of the specimens originally referred to that variety belong to the latter species: others are merely *L. glauca* with dull purple flowers.

Rubiaceæ.

MACHAONIA FASCICULATA. Ramis calyceque puberulis, cæt. fere glabra; foliis lineari-spathulatis eveniis in axillis fasciculatis subsessilibus parum semipollicaribus; floribus 4-meris; calycis lobis lato-ovalibus membranaceis tubo dimidio brevioribus; corolla subrotata majuscula. — Mexico, Coulter, no. 1167.

OLDENLANDIA GREENEI. Glabra, parvula; caule paniculato-ramoso e radice annua exili; foliis spathulato-linearibus obtusis basi attenuatis; floribus in dichotomiis et secus ramos breves nudos cymæ sessilibus; corollæ albidæ lin. 1–2 longæ subinfundibuliformis tubo calycis lobos parum superante; capsula quadrangulato-hemisphærico vel parum turbinato calycis dentibus subulatis paullo longiore; seminibus angulatis fere lævibus. — Pinos Altos Mountains of New Mexico, *E. L. Greene* (149), 1880. S. Arizona, in Ramsey's Cañon, 1882, *Lemmon.*

CRUSEA, Cham. As *Mitracarpus** is characterized by the circumscissile dehiscence of the fruit, the upper part with the persistent calyx-lobes falling off, so are *Richardia** and *Crusea* by the falling off entire of the somewhat gamophyllous calyx-limb from the fruit at the maturity or at the dehiscence of the latter. It is by an oversight that the limb of the calyx in *Crusea* is characterized as persistent in DC. Prodr. iv. 567, and in Benth. & Hook. Gen. ii. 144. The original character in the Linnæa, v. 165, "Achænia . . . . spermopodio persistenti plano apice affixa, sub maturitati sponte desilientia, integro calycis limbo tum seorsim deciduo," is explicit in this regard, and is correct. By all the essential characters we must refer to *Crusea* two small-flowered species of somewhat different habit, namely: —

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* If we are constrained by the laws of nomenclature to go back to the Linnæan name *Richardia*, adopted from Houston, for a genus intended to commemorate a Dr. Richardson of those days, notwithstanding the faulty and misleading form, we may more cordially restore the original *Mitracarpus* for the genus which

CRUSEA SUBULATA.* *Borreria subulata*, DC. Prodr. iv. 543. *Spermacoce subulata*, Pavon ex DC.; Hemsl. Biol. Centr.-Am. Bot. ii. 60. Besides the casting of the calyx-limb at dehiscence, the two carpels in this species leave in the axis a conspicuous carpophore, of their own length, narrow, and subulately bifid to near the middle, so that the plant could belong neither to *Spermacoce* nor to *Diodia*, and the carpels dehisce by a chink down the whole length of the commissural face. This species, not uncommon in Mexico, was collected by *Wright* in Arizona; at least seeds were gathered by him from which plants were raised in the Botanic Garden of Harvard University in the year 1852; and recently it has been collected in the same district by *Lemmon.*

CRUSEA ALLOCOCCA. Referring this to *Crusea*, I shall not add unnecessarily to the synonymy by imposing this specific name. It is *Diodia tricocca*, Torr. & Gray, Fl. ii. 30, and *D. tetracocca*, Hemsl. l. c. 56, t. 40, f. 10–15, and the carpels vary from three to four, both in Texan and in Mexican specimens, although the lesser number prevails in Texas. The species varies greatly in the width of the leaves and in pubescence; both the fruits and the herbage are sometimes quite smooth and glabrous, sometimes puberulent or hirsute, and in no. 1187 of Palmer's collection even hispid. The carpels are dorsally very convex, ventrally flattened, and either closed or with the thin commissural face more or less ruptured in dehiscence; the carpophore weak, and

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has been inadvertently written *Mitracarpum* by all succeeding botanists, except Bentham (in Bot. Voy. Sulph.) and myself, who endeavored to improve it into *Mitracarpium.* By referring to the original publication of Zuccarini's name and character in Roem. & Schult. Syst. Mant. iii. 210, it will be seen that the "*Mitracarpum*" and the "*Mitracarpum scabrum*" there cited are accusatives (as the form of the word should sufficiently indicate); and the index to the volume accordingly gives us "*Mitracarpus scaber.*" No increase of the synonymy should come from the remanding of the genus to its proper gender.

* The "*Crusea subulata*" in Hemsley, Biol. Centr.-Am. Bot. l. c. 57, is a slip of the pen or a misprint of *Crusea subalata*, Hook. & Arn. Bot. Beech. Voy. 431.

very attenuate upward. The ticket of Berlandier's no. 2382 = 952, bears the record "fl. flammei." But surely the corolla in this and the preceding species is white or nearly so. No stable characters are found to distinguish Hemsley's *Diodia tetracocca* from the Texan plant, long ago described as *D. tricocca.*

The following Cuban genus is to be added to the tribe.

NODOCARPÆA, Nov. Gen. *Spermacocearum.*

Calycis limbus nullus. Corolla epigyna rotata, tripartita (an semper), lobis ovatis æstivatione valvatis. Stamina 3, sinubus corollæ inserta, brevissima: antheræ ovales. Ovarium obovato-globosum, biloculare. Ovula in loculis solitaria, septo medio peltatim affixa, amphitropa, micropyle infera. Stylus brevi-filiformis: stigmata 2, obtusa. Capsula globosa, parum didyma, tenui-coriacea, corolla marcescente diu apiculata, dicocca, coccis demum solutis clausis, axi nullo interposito. Semen nitidum, ovale, plano-convexum vel meniscoideum, ventre sulcatum. — Herbula Cubensis, tenella, flaccido-decumbens et radicans; stipulis interpetiolaribus tenuibus parum vaginantibus subulato-attenuatis pinnato- vel ramoso-setiferis; foliis ovatis subsessilibus costa excepta enerviis oppositis, summis alaribusque quaternis vel ternis flores 1–4 parvos sessiles involucrantibus; corolla "alba." (Νωδός, toothless, καρπός, fruit.)

NODOCARPÆA RADICANS. *Borreria radicans*, Griseb. Cat. Pl. Cub. 142. — Forma HIRTA, foliis caulibusque pilis longis undique hirsuta. — Forma glabrescens, magis tenella, pilis fere destitula. — Western part of Cuba, on the moist banks of rivers and lagunes, *C. Wright*, no. 2774.* The difference between the hairy and the glabrate forms is so striking, that, since the collector's original tickets indicate at least three separate stations and different dates of gathering the specimens, I was disposed to regard them as distinct species; but a few scattered hairs on the glabrate form render the separation unadvisable. The larger leaves of this little plant are 3 lines, the smaller only 2 lines in length. Capsule half a line at most in length.

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* Part of the distribution consists of a slender and radicant form of no. 2769, *Diodia simplex*, Swartz, according to Grisebach, viz. his *Borreria simplex*, but truly a *Diodia.*

Spermacoce rubricaulis, Wright in Sauvalle, Fl. Cubana, 71, no. 3590 of distribution, is identical with no. 2768, named by Grisebach *Borreria spinosa*, Cham. & Schlecht.; and it may be a slender form of that species, but it wants the spinulose murication which gives the name.

Spermacoce Domingensis, 2770 of same collection, *Borreria*, Griseb. Cat. Pl. Cub. 141, appears to be *S. parviflora*, a narrow-leaved form, which occurs also in Florida.

Spermacoce richardsonioides, Wright, l. c., 73, founded on *Richardsonia muricata* Griseb. l. c. (no. 2776), is, as Grisebach had concluded, a dicarpellary *Richardia.*

Diodia lippioides, Griseb. Cat. Pl. Cub. 141 (2762 of Wright's collection) is remarkable — although Grisebach overlooked it — for having a solitary calyx-lobe! This persists on one of the cocci, while the other has none at all.

GALIUM. The revision of this genus for the North American Flora brings in few additions and few changes that have not already been indicated. The following are the principal.

GALIUM TEXENSE is a name proposed to take the place of *G. Californicum*, var. *Texanum*, Torr. & Gray, Fl., which was later referred to the Mexican *G. uncinulatum*. Our plant better accords with the character of *G. obstipum*, Schlecht., but still seems to be distinct from the Mexican species, one or more, to which it is nearly related, and it is an annual. The form *Texense* is used because Scheele introduced a *G. Texanum*, founding it on a mere form of *G. virgatum*, and badly describing it.

GALIUM KAMTSCHATICUM, Steller, is a species allied to *G. circæzans*, which ranges from the mountains of Lower Canada (where it was recently collected by Dr. Allen of New York), and the higher mountains of New England (where it is known as *G. Littellii*, Oakes, *G. circæzans*, var. *montanum*, Torr. & Gray), to those of Oregon and Washington Territory, Unalaska, Kamtschatka, and Sagalien. One cannot understand why Ledebour referred this plant to *G. obovatum*, HBK., a species figured as having unicostate leaves and inhabiting Equatorial America.

GALIUM ARKANSANUM. This is *G. latifolium β*, Torr. & Gray. It has, indeed, the flowers and inflorescence of that most distinct species, but has more scabrous-hispidulous and narrow *unicostate* leaves. Besides Dr. Engelmann's specimen, it is known to us by a linear-leaved form collected at the Hot Springs of Arkansas by *Dr. Foreman* of Washington.

GALIUM MATTHEWSII. *Trichogalium*, inter *G. angustifolium* et *G. stellatum*, glabrum, læve, frutescens ; caulibus paniculato-ramosissimis ; foliis rigidis oblongo- vel ovato-lanceolatis parvis, superioribus apice cuspidato-acutatis ; setis fructus immaturi rigidulis breviusculis. — Arid district in Inyo Co., California, *Dr. Matthews.*

GALIUM BOLANDERI, Gray, Proc. Am. Acad. vii. 350, proves to have been founded on a male plant of the white-berried species which, collected in fruit by Sir Joseph Hooker and myself, was published as *G. margaricoccum*, Gray, l. c. xiii. 371.

Valerianaceæ.

Valeriana Arizonica. — Glabra, semipedalis; caulibus e rhizomatibus repentibus crassiusculis erectis præter radicalia 2–4-phyllis; foliis succulentis, radicalibus ovatis integris subintegerrimis (pollicaribus) paucisve secus petiolum longiorem 2–4-lobulatis, caulinis subsessilibus 3–5-partitis; cyma glomerato-congesta; corolla semipollicari tubulosa, tubo in faucem sensim ampliato limbo quintuplo longiore. — Arizona; in mountains near Prescott, *Palmer*, 1876; Santa Catalina Mountains, at 7,000 feet, *Lemmon*. In character somewhat between *V. Sitchensis*, Bong., and *V. pauciflora*, Michx.; with the elongated corolla of the latter.

Valeriana sorbifolia, HBK., is an accession to the North American flora, a form of it, mostly with unusually large and broad leaflets, having been collected in a cañon of the Huachuca Mountains, S. Arizona, by *Lemmon*, 2713, 2728.

Valerianella. In Torrey and Gray's Flora of North America, the long-flowered species from Arkansas, forming the section *Siphonella*, were judged to effect such a transition to *Fedia* that, following Gærtner and Vahl, *Valerianella* was reduced to *Fedia*. This was not well; for *Valerianella* is not only the older name, but one of numerous published species, while there is hardly more than one true *Fedia*. But the junction under the name of *Valerianella*, Tourn., Haller, &c., must needs be made, and *Plectritis*, DC., should be included. There is now a species of the latter which has a spurless corolla; the rudiment of the spur, in the form of a small saccate or conical protuberance, is not uncommon in several of our Valerianellas, notably in *V. amarella*, *V. Nuttallii*, and even *V. longiflora;* while the Betckea section has the wings of the fruit replaced by nerviform rudiments of the sterile cells. The limb of the corolla is not quite regular in the *Siphonellæ*, is either nearly regular or decidedly bilabiate in different species of *Plectritis;* so that nothing but the diandrous instead of triandrous flower is left to characterize *Fedia*. Whatever view be taken of that genus, it is evident that the American forms (*Siphonella*, *Plectritis*, *Betckea*, the latter already united) all fall into one genus.*

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* VALERIANELLA, Tourn., Haller, Mœnch: spec. Am. Borealis.

§ 1. Valerianella propria. — *Valerianella*, Krok, Monogr. Valer.; Benth. & Hook. Gen., excl. § *Siphonella*.

* Inquilina, subcæruliflora: fructus loculus fertilis dorso suberoso-incrassatus.

V. olitoria, Pollich. *V. cærulea*, Aikin in Eaton, Man. Bot.

Lobeliaceæ.

PARISHELLA, Nov. Gen. *Cyphiearum.*

Calyx 5-fidus, tubo campanulato adnato lobis spathulatis foliaceis breviore. Corolla subrotata, calyce brevior, profunde fere æqualiter 5-fida. Stamina 5, a corolla libera: filamenta (basi tantum discreta) in tubum gracilem apice inflexum connata: antheræ liberæ, nudæ, ovales, loculis introrsum dehiscentibus. Ovarium biloculare, multiovulatum: stylus filiformis: stigma depresso-capitatum, bilobum, exannulatum. Capsula turbinata, infera, polysperma, vertice inter calycis lobos persistentes operculatim dehiscens, operculo late conico stylo apiculato cum corolla marcescente demum deciduo. Semina globosa, fere lævia.

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* * Regione orientali indigenæ, albifloræ.

+- Fructus pl. m. triangularis, loculis sterilibus fertili minoribus ad angulam obtusiorem: corollæ tubus gracilis fauce limboque subæquilongus.

V. CHENOPODIFOLIA, DC. — *V. triquetra*, Shuttleworth in Flora, 1837, 211, t. 3. *V. Fagopyrum*, Walp. Repert. ii 527. *Fedia chenopodifolia*, Pursh, Fl. ii. 727. *F. Fagopyrum*, Torr. & Gray, Fl. ii. 51. Shuttleworth, having Virginian specimens of this species, suspected it to be the plant briefly described by Pursh. Having examined the original in the Sherardian herbarium, I can confirm this judgment.

V. AMARELLA, Krok, Monogr. Valer. 55, t. 2, f. 14. *Fedia amarella*, Lindheimer, Engelm. in Pl. Lindh. ii. 217. Texas; named from a peculiar bitterness of the herbage, which is wanting in the associated species, according to Lindheimer. A saccate gibbosity, at the base of the throat of the corolla, is in some flowers almost spur-like.

+- +- Fructus oblongo- seu ovato-tetragonus, antice inter loculos steriles contiguos fertili non latiores nec majores sulcatus.

V. STENOCARPA, Krok, Monogr. *Fedia stenocarpa*, Engelm.

V. RADIATA, Dufresne, non DC.

+- +- +- Fructus loculi steriles ampliati aut inflati aut valde divergentes fertili multo majores.

V. WOODSIANA, Walp., Krok, l. c. *Fedia Woodsiana*, Torr. & Gray, Fl. ii. 52.

Var UMBILICATA. Fructus maturus loculis sterilibus introrsis confluentibus vesiculosis centro profunde umbilicatis, ore subrotundo. — *V. umbilicata*, Krok. *Fedia umbilicata*, Sulliv. *F. radiata*, var. *umbilicata*, Porter in Am. Nat. vi. 387, t. 108.

Var. PATELLARIA. Fructus quasi meniscoideus, basi apiceque emarginatus, loculis sterilibus maxime divergentibus demum applanatis alæformibus nunc marginibus pl. m involutis. — *V. patellaria*, Krok. *Fedia patellaria*, Sulliv. *F. radiata*, var. *patellaria*, Porter, l. c. 387, t. 106.

§ 2. SIPHONELLA, Krok. — *Fedia* § *Siphonella*, Torr. & Gray, Fl. ii. 50. Species 2 Arkansanæ.

V. LONGIFLORA, Walp. Corollæ tubo filiformi purpurascente lobis albis 3–4-plo longiori juxta basim gibbere parvo instructo; fructus loculo fertili apice lato-obtuso. — *Fedia longiflora*, Torr. & Gray, l. c.

V. NUTTALLII, Walp. Corollæ albæ tubo lobis duplo longiori versus medium gibbere parvo instructo; fructus loculo fertili angusto-apiculato. — *Fedia Nuttallii*, Torr. & Gray, l. c.

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§ 3. PLECTRITIS, Lindl. Bot. Reg. t. 1094. *Plectritis* & *Betckea*, DC. *Plectritis*, Benth. & Hook. — Spec. Amer.-Occidentalis.

* Fructus cum ala circumdata meniscoideus, nunc acetabuliformis, dorso obtuse angulatus: cotyledones faciei ventrali parallelæ: flores parvi.

V. MACROCERA. — *Plectritis congesta*, var. *minor*, Hook. Fl. i. 291. *P. macrocera*, Torr. & Gray, Fl. ii. 50. Runs into various forms; the spur of the corolla sometimes as long as the body, not rarely rather short; the tube below its origin either slender and stipe-like or short, sometimes very short. So the specific name is not always appropriate.

* * Fructus dorso carinato-angulatus: cotyledones contrarieæ, i. e. faciei ventrali accumbentes.

+ Alæ fructus sat evolutæ, pl. m. introrsæ.

++ Corolla *ecalcarata*, parva; fauce lato-infundibulari, basi hinc gibbere parvo mammæformi nunc evanido instructa, limbo æqualiter 4-partito, segmento postico emarginato vel bifido: fructus dorso acute carinatus, ala lata basi introrsa superne patente.

V. ANOMALA. — Wet grounds on the Columbia River and near it, *Howell*, *Suksdorf*. This appears to produce also some wingless fruit.

++ ++ Corolla basi calcarata.

V. CONGESTA, Lindl. Bot. Reg. t. 1094. *Plectritis congesta*, DC. Corolla usually 4 lines long and with exserted genitalia. Fruit salient into an acute angle dorsally, but the edge not so acute as in the preceding, or even slightly bevelled. *P. brachystemon*, Fisch. & Meyer, Ind. Sem. Hort. Petrop. 1835, Suppl., according to an authentic specimen of the cultivated plant, is a small-flowered form of this species, with downy fruit. But the character, "flores quadruplo minores albos et stamina non exserta," points to *P. macrocera*.

V. APHANOPTERA. *V. samolifoliæ* persimilis, præter fructus paullo majorem, aliis angustis incurvis inconspicuis. — Wet hillsides along the Columbia River, Klikitat Co., Washington Terr., *Suksdorf*. And an imperfect specimen, collected on " Columbia Plains " by Nuttall, distributed as *Plectritis capitata*, appears to be the same.

+ + Alæ fructus subæqualiter triquetri nullæ. — *Betckea*, DC.

V. SAMOLIFOLIA. — *Betckea samolifolia*, DC. l. c. 642. *B. major*, Fisch. & Meyer, Ind. Sem. Petrop. l. c. (5) 30. *Plectritis samolifolia* & *P. major*, Höck in Engler, Bot. Jahrb. iii. 37. Raised in 1835, from seed collected at the Russian colony Ross, in California; specimens differing from the Chilian only in somewhat larger size, — of small consequence in an annual. Recently collected by *H. N. Suksdorf*, in low grounds on the Columbia River, "without doubt indigenous," says this excellent collector and acute observer. The preceding may prove to be a mere state of this species; and in any case the value of *Betckea* even as a section is destroyed.

Parishella Californica. Herba exigua, monocarpica, glabella; foliis spathulatis cum floribus axillaribus brevipedunculatis in collo rosulato-confertis mox proliferis, ramis depressis inferne nudis; corolla alba. — At Rabbit Springs, in the Mohave Desert, May, 1882, *S. B. & W. F. Parish.* It is interesting indeed to add to our Flora a second genus of the very peculiar tribe to which *Nemacladus* of Nuttall belongs. The habit of this little plant is quite unlike that of its nearest relative; but the floral structure is very similar. The comparatively large and foliaceous calyx-lobes, completely adnate ovary, and the short and regular almost rotate corolla, furnish good generic characters; and above all there is the subapical circumscissile dehiscence. The capsule is indeed a pyxidium, the broad and low conical apex within the calyx-lobes falling away as a lid. The plant forms a small slender-rooted tuft, close to the ground, of spatulate entire leaves, which are only a quarter or half an inch long, subtending short-peduncled flowers: the calyx-lobes, of one or two lines in length, soon much surpass the white corolla. In the manner common to many of these desert annuals, three or four radical branches are sent out with a long naked internode, and at apex a tuft of leaves and flowers like the primary one, these again proliferous, &c. As there is already a genus *Parishia* in another part of the world, I have to adopt a different form in naming this small but very interesting plant in honor of the discoverers, my invaluable correspondents, two brothers of great botanical zeal and acuteness, who in the few years of their residence in San Bernardino have wonderfully opened up the botany of that portion of California, having already sent us many new plants of that region, in excellent specimens, and most kindly in every way assisted us and other botanists. A brief note upon this plant was published in Coulter's Botanical Gazette, vii. (1882) 94.

Ericaceæ.

Gaultheria. The two forms of *G. Myrsinites,* which are indicated in the Synoptical Flora of North America, now known to us in abundant specimens from various stations, and recently by complete specimens with notes from W. N. Suksdorf of Washington Territory, are manifestly of two species, with the following distinguishing characters: —

Gaultheria Myrsinites, Hook. Cæspitoso-depressa, undique glabra; foliis ovalibus vel rotundatis plerumque semipollicaribus; corolla depresso-campanulata calycem parum superante. — Alpine and subalpine meadows and damp hillsides, in the Rocky Mountains

from British America to Colorado and Utah, and westward on the higher Cascades and Sierras from Washington Territory to the borders of California.

GAULTHERIA OVATIFOLIA. Major, dodrantalis; ramis adsurgentibus calyceque pilis mox ferrugineis pilosis; foliis lato-ovatis etiam subcordatis pollicaribus immo sesquipollicaribus magis serrulatis; corolla campanulata calycis lobis acutioribus duplo longiori. — Wooded banks of streams and cañons of the Cascade Mountains, borders of British Columbia, Washington Territory, and N. Oregon, coll. *Lyall, E. Hall, S. Watson, W. N. Suksdorf.*

Asclepiadaceæ.

METASTELMA ARIZONICUM. Caulibus fere filiformibus e basi lignescente ultrapedalibus filiformibus puberulis; foliis crassiusculis angusto-linearibus acutis basi abrupta parum latiore petiolatis eveniis marginibus mox revolutis; cymulis paucifloris in axillis subsessilibus; corolla lin. 2 longa campaniformi 5-partita, lobis lanceolatis obtusiusculis intus villo brevi retrorsum barbatis; coronæ squamis 5 attenuato-linearibus stigma superantibus basi columnæ antheris paullo breviori insertis. — Arizona, on hills near Tucson, May, 1883, *Pringle.*

ASCLEPIAS CURTISSII. Juxta *A. obovatam* collocanda; caule puberulo 1–3-pedali; foliis glabellis oppositis ovalibus brevi-petiolatis subtransverse lineato-venosis internodiis 2–3-plo longioribus (sesquipollicaribus); umbellis subsolitariis brevi-pedunculatis; floribus pauciusculis viridulo-albidis; cucullis subhastato-lanceolatis rectis arrectisque gynostemium longe superantibus supra basim marginibus latis tenuibus inflexis, cornu infra medium orto falcato-incurvo lato apice adsurgente; antherarum alis latissimis angulo acuto; columna brevissima. — Eastern part of S. Florida, *A. H. Curtiss,* 1879. (This has recently been published in the supplement to a re-issue of Chapman's Flora of Southern U. S., 643.)

ASCLEPIAS LEMMONI. Procera, pilis patentibus multiarticulatis pubescens vel in caule hirto-villosa: foliis magnis (5–10-pollicaribus) oppositis ovalibus obtusissimis basi subcordatis subsessilibus; pedunculis folio paullo brevioribus; umbella multiflora; pedicellis uncialibus villoso-hirtis; floribus inter maximos; petalis (lin. 5 longis) ovatis flavo-viridulis glabris; columna staminea brevi; cucullis albidis (lin. 4 longis) antheras longe superantibus ovato-sublanceolatis superne patentibus versus basim obtuse bidentatis et cornu oblongo plano obtusissimo instructis, costa callosa purpurascente; folliculis pubescentibus. — S. Arizona, near Fort Huachuca, on slopes in Tanner's Cañon, in fruit and flower; also in coll. of 1881, fruit only, in Rucker Valley, *Lemmon.*[*]

Loganiaceæ.

Buddleia Pringlei. Inter *Globosas* et *Verticillatas*, Benth. quasi media; ramis ramulisque glabris; foliis nascentibus furfuraceo-canescentibus, adultis glabris viridibus oblongis vel lato-lanceolatis obtusiusculis subintegerrimis (parum bipollicaribus) basi attenuatis breviter marginato-petiolatis; capitulis plurifloris interrupte spicatis, plerisque subsessilibus nudis approximatis, infimis remotioribus in axillis foliorum magis pedunculatis; corollæ tubo e calyce albo-tomentuloso vix exserto lobis 2–3-plo longioribus, fauce hirsutula; ovario apice tomentoso; stigmate incrassato, lobis cohærentibus. — Arizona, in fields near Tucson, May, 1883, *Pringle.*

Gentianaceæ.

Gentiana Forwoodii. *Pneumonanthe*, *G. affini* sat similis; corollis subdimidio minoribus; caulibus adsurgenti-diffusis (6–12-pollicaribus) usque ad apicem crebrius subæqualiter foliosis; foliis oblongis imisve ovatis summis nunc angusto-lanceolatis; calyce subcampanulato brevi (lin. 2–3-longo) prorsus edentato margine sphacelato aut inæqualiter crenato-bilobo aut hinc fisso quasi spathaceo. — High meadows of the Wind River Mountains, *Dr. W. H. Forwood*, U. S. A.; coll. August, 1882, a low form, with stems little over a span high, equably leafy to the very top, the leaves 6 or 7 pairs, uppermost closely subtending the three or four clustered flowers and of equal length; the specimens bearing small resemblance to *G. affinis*. Again collected in August, 1883, in abundant specimens, of 6 to 12 inches in height, with longer upper internodes, narrower upper leaves, short-spiciform or racemiform inflorescence of few or several flowers, and so displaying its near relationship to *G. affinis*, the calyx-teeth of which, generally large, are variable, and in some flowers a part or even all of them obsolete. The corolla in this new species is decidedly smaller, not over three fourths of an inch long, narrow, and with shorter and rounder lobes, these little surpassing the plical appendages. None of the very many specimens, from several stations,

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[*] In Lemmon's collection (fruit in 1881, flowers in 1882) we have *Asclepias glaucescens*, HBK., or, if the species are different, *A. elata*, Benth. Pl. Hartw. It is evidently the latter, which appears to be common in Mexico; but we suppose the plant described and figured by Kunth is only a somewhat smaller-flowered and narrower-leaved variety of the same species.

shows the least vestige of lobes or teeth to the calyx. The rare specimens of *G. affinis* in which these are obsolete in some of the flowers have the more ample corolla of that species.

GENTIANA BIGELOVII. *Pneumonanthe*, *G. affini* proxima; foliis angustis crassioribus, superioribus linearibus; floribus spicato-congestis; corolla vix pollicari vel minore cylindracea extus scabrida et lineis prominulis crenulato-scabris notata, lobis brevibus lato-ovatis plerumque erectis plicarum lobulis bifidis duplo longioribus; stipite capsulæ brevi fistuloso; seminibus ala angusta crassiuscula cinctis. — *G. affinis*, Torr. Bot. Mex. Bound. 157, &c. — Colorado to Arizona. In S. Arizona, on a high plateau, at 9,000 feet, *Lemmon*, 1882. This has passed as an extreme form of *G. affinis*, but it decisively differs by its oblong rather than funnelform corolla, with shorter lobes, and by the salient crenulate or roughened ridges which in the bud externally border the infolded plicæ; the stipe is shorter and broader, and completely fistulous, so that some of the seeds fall into it even to the bottom. No. 1567, coll. *Wright*, from New Mexico, is exactly like Lemmon's plant. Shorter and stouter specimens were collected in 1853 by *Bigelow* in the Sandia Mountains (although not enumerated in Pacif. R. Rep. iv.); and these are matched by Colorado specimens, no. 468, *Hall* & *Harbour*, 1862, and no. 329, coll. *Greene*.

Polemoniaceæ.

LŒSELIA (GILIOPSIS) HAVARDI. Perennis, humilis, diffuso-ramosissima, pilis multiarticulatis crispatulis cinereo-villosa; foliis plerumque pinnato-3–5-partitis, lobis filiformibus cuspidato-mucronatis; floribus sparsis nudis brevi-pedunculatis; corolla alba hypocraterimorpha, tubo lobis ovalibus obtusis mucronulatis calyceque paullo longioribus, fauce parum obliquo; filamentis æqualiter insertis corollæ lobos æquantibus valde declinatis et superne involuto-incurvis; ovulis numerosis. — W. Texas, on the Rio Grande near Presidio del Norte, *Dr. N. Havard*, 1881. Another of those Gilioid species which tend to confuse *Lœselia* and *Gilia*. But if the strongly declinate and even involute filaments of the present species do not exclude it from *Gilia*, both genera will in the end have to be combined with *Polemonium*.

Hydrophyllaceæ.

PHACELIA POPEI, Torr. & Gray, in Pacif. R. Rep. ii. 172, t. 10, is to be re-established, and to be referred to the subdivision with "calyx more or less setose-hispid." The seeds, which are pretty well figured, are short-oval and roughened by muriculate toothing of the reticulations and some rugosity. The recent distribution of Curtiss, as *P. glandulosa*, no. 2128* in his sets of United States plants, belongs to it. Also Wright's no. 1578.

PHACELIA PARISHII. *Eutoca*, *P. demissæ* et *P. pulchellæ* proxima, seminibus oblongis prioris, viscidula; foliis ovalibus repando-crenatis; spica densiflora longiuscule pedunculata; calycis lobis lato-spathulatis corolla parum brevioribus capsulam ovali-oblongam circa 20-spermam æquantibus; stylo hirsuto apice brevissimæ bilobo. — Near Rabbit Springs, of the Mohave Desert, May, 1882, *S. B. & W. F. Parish.* A span high, the earliest peduncles nearly radical. Fructiferous calyx fully 3 lines long, thickish, foliaceous; the pedicels very short. Corolla campanulate, blue in the dried specimens, only 2 lines long, the internal appendages obscure or none. Seeds fully half a line long.

PHACELIA PACHYPHYLLA. *Microgenetes*, pube brevi viscidissima, robusta, subpedalis, patenti-ramosa; foliis succulentis siccitate crasso-coriaceis rotundatis sæpe subcordatis fere integerrimis, inferioribus 1–2-pollicaribus cum petiolo percrasso æquilongo, superioribus subsessilibus; spicis brevi-pedunculatis sæpius geminatis densifloris; calycis lobis lato-linearibus corollam campanulatam lin. 2–3 longam cæruleam capsulamque subglobosam polyspermum æquantibus; seminibus ovali-oblongis semilineam longis. — Dry alkaline lakes, near Calico Mines, Mohave Desert, May, 1882, *S. B. & W. F. Parish.* A most peculiar species, to be placed at the end of the *Microgenetes* section. Internal appendages of the corolla small and narrow, connected at the base with the short dilated base of the filaments.

PHACELIA ORCUTTIANA. *Microgenetes*, inter *P. Cumingei* Chilensem et *P. Fremonti* collocanda, viscido-pubens, subpedalis, erecta; foliis pinnatifidis, lobis brevibus integerrimis; spicis elongatis densifloris; corolla rotato-campanulata ochroleuca vel alba fauce flava calyce duplo longiore, plicis vix ullis; capsula ovali-oblonga sepalis angusto-spathulatis subæquilonga 12–14-sperma; seminibus ovalibus favoso-corrugatis. — Mountains of Lower California near the U. S. border, *Charles N. Orcutt.*

Mr. Orcutt likewise collected in Lower California a well-marked and very viscid species of the *Eutoca* section, which was described under an appropriate name; but being informed that it was some years ago named by Dr. Kellogg from specimens collected by Dr. Veatch, and is about to be published in California, I leave it without further notice.

Borraginaceæ.

ERITRICHIUM MOLLE. Inter *Eueritrichium* et *Krynitskiam*, depresso-diffusum, caulibus elongatis basi repentibus radicantibus ut videtur perennans, pilis laxis crebris molliter hirsutum vel potius villosum; foliis elongato-lingulatis (plerisque bipollicaribus); spicis demum elongatis subsolitariis ebracteatis villosis; pedicellis calycis segmentis lineari-oblongis (fructiferis laxis) dimidio brevioribus; corolla alba, limbo lin. 3 lato; nuculis (lineam longis) trigono-ovatis modice obcompressis dorso vix carinatis grosse areolato-rugosis intus superne carinatis, inferne triente cicatrice ovato-lanceolata gynobasi brevi-oblongo affixis. — Sierra Valley, California, on alkaline wet flats and borders of ponds, *Lemmon*, 1874 to 1883, at length with good fruit. In the Botany of California (i. 528) this is referred to as perhaps a decumbent form of *E. Kingii*, of which the fruit was characterized, partly from the original account, and partly from immature nutlets of the present plant, or of *E. Kingii ?* collected by Lemmon in the same district, but on sandy dunes. The plant now described is very different from *E. Kingii*, of which I have only now seen, through Prof. Eaton's kindness, the mature, muricate-rugose fruit. Evidently the present plant is most nearly related to *E. Scouleri*, although the scar of the nutlets is wholly introrse.

ERITRICHIUM COOPERI. *Eueritrichium, Myosotidea, E. Californico* et *E. Scouleri* affine, patenti-diffusum e radice ut videtur annua, setis patentissimis brevibus undique hispidum; foliis subsucculentis fere omnibus alternis linearibus (semipollicaribus); caulibus longe racemifloris inter flores brevissime pedicellatos hinc inde bracteatis; corollæ rotatæ limbo 2–3 lin. lato albo in centro flavo; calyce fructifero aperto sesquilineari profunde 5-partito; nuculis ovatis trigono-obcompressis obtusiusculis glabris ventre reticulato-rugosulis dorso transverse rugosis, cicatrice brevi sublineari. — Mohave Desert, S. E. California, at Camp Cady, *Dr. Cooper*, 1860–61; Rabbit Springs, May, 1882, *S. B. & W. F. Parish*, near to and in water.

ERITRICHIUM OXYGONUM. *Krynitzkia, E. muriculato* proximum; cyma terminali pedunculata sæpius triradiata; nuculis calycis lobis oblongo-lanceolatis obtusiusculis paullo brevioribus subtriquetris *Fagopyri* instar ex ovata subacuminatis, dorso leviter convexo parce muriculato, angulis lateralibus acutis, faciebus lævibus planis, angulo ventrali sulco sat lato gynobasi elongato-subulatæ usque ad apicem inserto. — Limb of the rotate corolla 2 lines broad, with conspicuous appendages in the throat. Nutlets a line long. — S. E. California, on hills bordering the Mohave Desert, *Pringle*, 1882.

ERITRICHIUM MICROMERES. *Krynitzkia*, erectum, subpedale e radice ut videtur annua, pilis patentibus brevibus hirsutum vel hispidum; caule gracili ramosissimo; foliis parvis (lin. 3–6 longis) linearibus integerrimis; spicis filiformibus pedunculatis demum sparsifloris; floribus minimis; corolla inconspicua; calyce etiam fructifero vix ultra semilineam longo setis uncinatis hispidissimo, lobis lanceolatis obtusiusculis fructum parum superantibus; nuculis ovato-trigonis acutangulis dorso demum muriculato-scabris, sulco ventrali latiusculo basi subito dilatato. — Near Santa Cruz, California, 1881, *Marcus E. Jones*.

ECHIDIOCARYA URSINA. Depressa, ramosissima, hispida; floribus fere omnibus folioso-bracteatis; corollis minimis; nuculis breviter stipitatis distinctis lævibus (haud muriculatis) lineis leviter prominulis reticulatis. — Common on dry slopes of Bear Valley in the San Bernardino Mountains, S. E. California, *S. B. & W. F. Parish*, 1879 and 1882. This and the nearly related *E. Californica* effect nearly a transition to the *Plagiobothrys* section of *Eritrichium*.

Convolvulaceæ.

IPOMŒA THURBERI, Gray. *Pharbitis*, præter folia quandoque utrinque hispidulo-pubescentia glaberrima; radice perenni tuberosa; caulibus gracilibus procumbentibus; foliis cordato-hastatis acuminatis (lobis sæpius bifidis) vel superioribus 5–7-fidis lobis triangulari-lanceolatis divergentibus; pedunculis unifloris petiolo brevioribus supra bracteolas clavato-incrassatis; sepalis (pollicaribus) elongato-lanceolatis sensim acuminatis æqualibus glaberrimis; corolla ultra-bipollicari purpurea e tubo gracili superne infundibuliformi; stigmate trilobo; ovario triloculari (nunc 4-loculari?); seminibus furfuraceo-puberulis. — Syn. Fl. ii. 212. — Southern Arizona, now collected in flower, on limestone rocks, by *J. G. Lemmon*. And the species proves to be of the *Pharbitis* group.

IPOMŒA CUNEIFOLIA. Exigua, glabra; caule gracili e cormo globoso enato decumbente; foliis cuneatis brevi-petiolatis e basi 5–9-nervatis apice inciso-dentatis, dentibus 3–7 lanceolatis; pedunculis filiformibus unifloris folium subæquantibus; sepalis (lin. 3–4 longis) oblongis obtusis, omnibus vel exterioribus secus costam processibus mollibus insigniter muricatis; corolla purpurea vix pollicari infundibuliformi; capsula parva 4-valvi disperma, seminibus tantum puberulis. — S. Arizona, in Tanner's Cañon, near Fort Huachuca, *Lemmon*. — The larger leaves of this remarkable species are hardly an inch long. The calyx resembles that of *I. capillacea*, Don (*I. muricata*, Cav.),

but the muricate processes are larger. Two distinct forms of the latter species are noted by Mr. Lemmon, one erect, the other diffuse-procumbent, the corms also different; and he suspects that *I. cuneifolia* may be a form of one of these, with the leaflets confluent into a cuneate simple leaf.

IPOMŒA LEMMONI. *I. leptotomæ,* Torr. peraffinis, prorsus glaberrima; caule debili vix volubili e cormo vel tubere crasso oblongo; segmentis foliorum pedatorum angusto-linearibus elongatis (majoribus bipollicaribus) tenuibus; pedunculis filiformibus unifloris petiolum gracilem haud superantibus; pedicello perbrevi bracteolis setaceo-subulatis parum longiori cum calyce glaberrimo; sepalis oblongis acutis submembranaceis, exterioribus costa vix prominula parce tenuiter muriculata; corolla angusta bipollicari; fructu adhuc ignoto. — Southern Arizona in the mountains near Fort Huachuca, *J. G. Lemmon.**

Solanaceæ.

SARACHA UMBELLATA, DC. Cat. Monsp.? Sweet, Brit. Fl. Gard. t. 85; G. Don, Syst.; Dunal in DC., but "Peru" cited as the country by Sweet, and subsequent authors following the lead. *Atropa umbellata,* Roth, Cat. ii. 26 (no habitat); Jacq. Hort. Schœnbr. t. 493, who gives "Mexico." A common Mexican species (the fruit edible and sold in the markets), described under several names, such as *S. Jatomata,* Schlecht., and probably his *S. allogona;* also *S. glabrata,* and probably *S. diffusa, laxa,* and *conspersa,* Miers, *S. Miersii,* Dunal. It came to be taken for Peruvian through some confusion with the nearly related *S. procumbens,* Ruiz & Pav. First collected now within the U. S. by *Lemmon,* in cañons near Fort Huachuca, S. Arizona. His specimens have peduncles shorter than the pedicels, which is not usual.

MARGARANTHUS LEMMONI. Decumbenti-ramosissima, magis foliosa; foliis omnibus integerrimis nec repandis; calyce profundius 5-dentato, dentibus tubo nunc dimidio brevioribus; corolla alba supra tubum brevissimum campanulato-urceolata, ore breviter obtuseque 5-lobo. —

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* *I. tenuiloba,* Torr. Bot. Mex. Bound. 148, — of which a specimen exists only in the Torrey Herbarium, and which was accidentally omitted in Syn. Fl. N. Amer., — is another species of this group. It has filiform leaflets, hardly thicker than the petiole, the latter shorter than the stout peduncle; sepals oblong; corolla as large as that of *I. sagittata;* root unknown. Torrey's remark on no. 1617, Wright, is to be excluded. That plant is *I. longifolia,* and the whole sentence belongs to the account of that species on p. 149, and was accidentally misplaced.

S. Arizona, in Cave Cañon, near Fort Huachuca, *Lemmon*. Resembles *M. solanaceus*, but with somewhat different habit, and with corolla so little urceolate that, if this species only were regarded, it would hardly be generically separated from *Physalis*. *P. minutiflora*, taken up by Dunal from Moçino and Sesse's drawings (but accidentally omitted from the *Calques des Dessins*), may be the same; but the "foliis repandis" would apply better to *M. solanaceus*, the "pruinosis" to neither.

Scrophulariaceæ.

PENTSTEMON RUBESCENS. *P. dasyphyllo* nimium affinis, minutissime pruinoso-puberulus; foliis angustissime linearibus glabratis; thyrso aperto, ramis patentibus sæpius trifloris; sepalis ovatis plerumque subito acuminatis glanduloso-puberulis; corolla sesquipollicari (ut videtur incarnata) e tubo brevi ventricoso-ampliata, lobis brevibus latis consimilibus, vel antico paullo longiore; antherarum loculis (ut in *P. dasyphyllo*) turgido-ovatis, valvulis ciliato-denticulatis. — S. Arizona, near Fort Huachuca, in Tanner's Cañon, *Lemmon.*

PENTSTEMON CÆSIUS. *Saccanthera*, inter *P. gracilentem* et *P. Roezli*, subpedalis e basi parum lignescente; foliis coriaceis glaucis integerrimis subeveniis, plerisque rotundis (semipollicaribus) in petiolum æquilongum marginatum subito decurrentibus, superioribus paucis spathulatis vel sublanceolatis sessilibus; thyrso laxifloro; sepalis oblongis pedicellis pedunculisque pruinoso-glandulosis; corolla (fere $\frac{3}{4}$-pollicari) tubulosa sursum parum ampliata purpurea seu violacea, limbo brevi intus glabro; filamento sterili filiformi glaberrimo. — S. E. California, on rocks in the San Bernardino Mountains, coll. Parry & Lemmon (1876, no. 304), *W. G. Wright*, 1880, *S. B.* & *W. F. Parish*, 1880 and 1882. A well-marked species, of which the materials were until now scanty. It has probably been somewhat distributed as a form of *P. lætus* or of *P. Roezli*, from which it widely differs both in the foliage, the glaucous hue, and the narrow corolla.

BUCHNERA PILOSA, Benth., var. ARIZONICA. Forma hispidula, nunc paniculato-ramosa. — Southern Arizona near Fort Huachuca, *Lemmon*, 1882. A form of the commonest and the most variable Mexican species.*

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* The American species north of the Isthmus have never been well determined. The subjoined memoranda may contribute in some degree to a better understanding of them.

CASTILLEIA CINEREA. E grege *C. pallidæ* et *C. viscidulæ*, multicaulis, spithamæa ad subpedalem, molliter cinereo-pubescens; caulibus adscendentibus conferte foliosis; foliis parvis (semipollicaribus sesquilineam latis) lineari-lanceolatis suberectis integerrimis, superioribus trifidis, floralibus 3–5-fidis spathulato-dilatatis luteo-tinctis viscido-glandulosis; spica brevi densa; calycis segmentis bipartitis, lobis linearibus; galea corollæ brevi-oblonga truncata tubo quadruplo breviore labio obtuse tricrenato 3–4-plo longiore; stigmate disciformi maximo. — S. E. California, on rocky hillsides of Bear Valley in the San Bernardino Mountains, 1882, *S. B.* & *W. F. Parish.*

CASTILLEIA PLAGIOTOMA. (§ Calyx normaliter bilabiatus, labiis latis, postico emarginato, antico parum longiore obcordato-bifido.) Bipedalis e radice crasso perenni, gracilis, ramosa, inferne glabella; spicis inferne sparsifloris cum bracteis calycibusque cinereo-pubescentibus vel tomentulosis; foliis imis angusto-linearibus, superioribus trifidis lobis linearibus, floralibus 3–5-fidis; calyce oblongo, labiis tubo paullo

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Ser. *A*. Calyx-teeth short, equal, broadly triangular or ovate, not surpassing the turgid-ovate mature capsule: corolla-tube pubescent or puberulent: stem strict, mostly simple, naked and pedunculiform at summit.

B. AMERICANA, L. Leaves broad and dentate: calyx-teeth acute. The common Northern species.

B. ELONGATA, Swartz. Leaves narrower, less dentate or entire: calyx-teeth obtuse. — W. Indies, Florida, Texas, and doubtless in the eastern part of Mexico.

Ser. *B*. Calyx-teeth short, triangular, unequal (the mouth oblique), barely equalling the gibbous capsule: corolla-tube glabrous.

B. OBLIQUA, Benth. in DC. Prodr. x. 498. Mexico. To this belongs a plant from Orizaba, *Botteri*, 94, and a part of the specimens distributed under no. 177, 365, from coll. *Ervendberg*, near Tantoyuca.

Ser. *C*. Calyx-teeth subulate, equal or nearly so, in fruit surpassing the straight but somewhat oblique capsule: stems simple or branched, leafy up to the infloresence.

* Corolla-tube pubescent.

B. PILOSA, Benth. Bot. Sulph. without char., & DC. Prodr. l. c. under *B. lithospermifolia*. Sometimes rather stout and 2 feet high, sometimes low and slender: radical leaves obovate or oblong, upper lanceolate to linear, the larger ones not rarely with a few teeth: tube of the corolla barely twice the length of the calyx, appressed-pilose outside. — *B. elongata*, var. *pilosa*, Cham. & Schlecht. in Linn. viii. 245. *B. lithospermifolia*, Benth. in DC. l. c., mainly; Gray, Proc. Am. Acad. v. 186 (pl. Ervendberg) in part. *B. elongata*, Hemsl. Biol. Centr.-Am. ii. 457, at least in great part —Mexico, in various forms; among them coll. *Bourgeau*, 884 in part, 2900, *Schaffner*, &c., S. Arizona, *Lemmon*, 2830, the var. *Arizonica*, indicated above. *B. lithospermifolia*, HBK., is from S. America, and is said to have a glabrous corolla with tube thrice the length of the calyx, the brevioribus corolla lutea vix brevioribus; galea recta tubo æquilonga, labio brevissimo. — On the Mohave Desert, S. E. California, May 18, 1882, *Pringle.* Remarkable for the anterior and posterior calyx-lobes.

ORTHOCARPUS IMBRICATUS, Torr. in Watson, Bot. King, 458, is a good species and was very wrongly referred to *O. tenuifolius*, Benth. in Syn. Fl. 300. It was characterized on poor specimens, which seemed to have a minutely uncinate tip to the galea; this, however, the numerous specimens now in hand do not have.*

CORDYLANTHUS PRINGLEI. *Adenostegia*, inter *Tetrastemones oligospermeas;* glabellus, elatus, ramosissimus; ramis gracillimis diffusis; foliis lineari-filiformibus integerrimis, imis pubescentibus ultrapollicaribus, ramealibus semipollicaribus glabris; bracteis flores 2–5-natos ad apicem ramulorum confertos subtendentibus flabelliformibus 3–5-lobatis brevibus; sepalis subæqualibus oblongis superne parce glanduloso-scabridis corolla brevi-oblonga lutea (lin. 4–5-longa) parum brevi-

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latter in fruit shorter than the capsule. This character as to the corolla (and also in the foliage) is exhibited by no. 3255 coll. Spruce on the Oronoco, distributed by Bentham as "*B. elongata,*" but its calyx appears to be quite glabrous.

* * Corolla-tube quite glabrous: stem very slender: leaves all narrow linear to filiform.

B. MEXICANA, Hemsl. Bot. Biol. Centr.-Am. ii. 457. Rather tall: tube of the corolla rather conspicuously exserted; the expanded limb a third to a half inch broad: calyx-teeth slender-subulate, in fruit spreading. — N. W. Mexico, *Seemann.* Mexico, *Hartweg*, 100 (referred to *B. lithospermifolia*, in Benth. Pl. Hartw., and by Hemsley); Orizaba, *Botteri*, 583, 794, form with smaller corolla.

B. DISTICHA, HBK. Nov. Gen. & Spec. ii. 340, ex char. Very slender: leaves mostly filiform: flowers small: tube of corolla less exserted: calyx-teeth shorter, triangular-subulate, erect or little spreading in fruit. *B. tinctoria*, Bertol. Fl. Guatemal. 426? — S. Mexico, *Ghiesbreght*, 8260. The original habitat Santa Fé de Bogotá? The plant here taken for this species was collected in that district by *Holton*, 585; also Venezuela, *Fendler*, 848.

* The three species of the first division of true *Orthocarpus*, in Syn. Fl. N. Amer., are better characterized as follows: —

+ Corolla and bracts rose-purple or purplish; the latter wholly chartaceo-scarious and reticulated in age.

O. IMBRICATUS, Torr. l. c. Usually slender and branched from the base; stem and leaves minutely puberulent: the rounded bracts either naked or sparsely ciliate at base, entire or usually with a single pair of short small lobes: calyx very short, its broad lobes with a pair of short and small subulate teeth: corolla hardly half inch long; lip and galea of equal length; the latter usually quite destitute of uncinate apex: anther-cells oval. — *O. tenuifolius* mainly, Gray, Bot. Calif. i. 577, partly, Syn. Fl., mainly. — Common in the mountains of the northern part of California and adjacent part of Oregon.

oribus. — California, on dry hills in Lake Co., August, 1882, *Pringle.* — A most distinct species, with short and obtusely lobed bracts and a short corolla.

CORDYLANTHUS, § 4. DICRANOSTEGIA. Calyx monophyllus (posticus), bipartitus, segmentis ovatis acuminatis uninerviis.

CORDYLANTHUS ORCUTTIANUS. Humilis, hispidulus, crebre foliosus; foliis etiam floralibus pinnatipartitis, lobis linearibus; floribus glomeratis; corolla flavescente, labiis æqualibus latis; filamentis glabris; antheris longiorum bilocularibus, loculo infero remoto fere casso, breviorum gracilibus anthera sterili bipartita aureo-hirsuta instructis. — Lower California, about 70 miles below the U. S. boundary, *H. C. Orcutt* and son. The specimens are only 6 inches high, mostly branched from the base, but it probably grows taller. It forms a peculiar section in the genus; the calyx evidently consisting of a posterior deeply two-parted sepal.

Lentibulariaceæ.

UTRICULARIA OCCIDENTALIS. Facie inter *U. minorem* et *U. intermediam;* caulibus foliisque prioris; scapa spithamæa 3–5-flora; pedicellis post anthesin subpatentibus; corollæ labio superiore palato inferioris rotundati (lin. 3–4 longi latique) paullo longiore, calcare latoconico acutiusculo lin. 2 longo adscendente. — Washington Territory, in Falcon Valley, *W. N. Suksdorf*, coll. 1880, 1883.

Verbenaceæ.

VERBENA ARIZONICA. *V. canescenti* proxima, e radice perenni multicaulis diffuso-patens, humilis, canescenti-hirsuta; foliis omnibus

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O. PACHYSTACHYUS, Gray. Low, stouter and the inflorescence densely imbricate-spicate, puberulent and above somewhat hirsute-pubescent; bracts (inch or more long), with one or sometimes two pairs of elongated lateral lobes, middle lobe oblong: calyx half the length of the corolla, deeply 2-cleft, and the divisions cleft to the middle into subulate lanceolate lobes: corolla over an inch long; galea with uncinate tip, surpassing the lip: anther-cells linear-lunate, acute at base. — Thus far collected only by *E. L. Greene*, in Siskiyou Co., California.

+ + Corolla yellow (as rightly said Pursh); bracts below more herbaceous, less reticulated the summit of the oblong middle lobe purple.

O. LINEARIFOLIUS, Benth. (*Bartsia tenuifolia*, Pursh.) Strict, branching at summit, sparsely hirsute or hispid, especially the margins of the 3-5-lobed bracts: calyx half the length of the corolla, its lobes with a pair of elongated subulate teeth: corolla two-thirds inch long, narrow; galea with small uncinate tip a little surpassing the lip: anthers oval. — Rocky Mountains in Montana to Oregon, first coll. by Lewis and Clark.

brevipetiolatis bis 3–5-partitis circumscriptione obovata, lobis crebris oblongo-lanceolatis (lin. 1–2 longis), pube hirsuto-sericea; spicis angustis confertifloris; bracteis subulato-lanceolatis calycem æquantibus; nuculis oblongis intus granuloso-scabris. — S. Arizona, in cañons near Fort Huachuca, *Lemmon.*

Labiatæ.

MONARDELLA PRINGLEI. E grege *M. lanceolatæ* et *M. undulatæ*, e radice annua ultrapedalis, mox multicaulis; foliis oblongo-lanceolatis acutiusculis basi attenuatis vix petiolatis integerrimis plerumque pollicaribus ramisque tenuiter puberulis, venis obscuris; bracteis villosis lato-ovatis subito tenuiter acuminatis plurinervatis albidis purpureo tinctis, venulis fere nullis; calycis dentibus subulato-lanceolatis acutis intus extusque hirsutis; corolla læte purpurea. — Sandy ridges, near Colton, San Bernardino Co., S. E. California, *Pringle.*